PB89-153761

Superfund Record of Decision (EPA Region 6)
Industrial Waste Control
Fort Smith, Arkansas, June 1988
First Remedial Action

(U.S.) Environmental Protection Agency
Washington, DC

28 Jun 88

U.S. Department of Commerce
National Technical Information Service
NTIS

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R06-88/036	2.	3. Recipient's Accession No. PB89 153761/AS
4. Title and Subtitle SUPERFUND RECORD OF DECISION Industrial Waste Control, AR First Remedial Action - Final			5. Report Date 06/28/88 6.
7. Author(s)			8. Performing Organization Rept. No.
9. Performing Organization Name and Address			10. Project/Task/Work Unit No. 11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460			13. Type of Report & Period Covered 800/000 14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 8-acre Industrial Waste Control (IWC) site, an abandoned coal strip mine, is a closed industrial waste landfill about 8 miles southeast of Fort Smith near Jenny Lind, Sebastian County, Arkansas. Landfilling operations began in the late 1960s or early 1970s and primarily dealt with municipal refuse and debris, and industrial trash. In August 1974, the site was purchased by Grady Shipley and granted an industrial landfill permit by the Arkansas Department of Pollution and Ecology. The site received a wide variety of liquid wastes (including methylene chloride, phenols, cresylic acid, and paints), solid wastes, and sludges. In addition, the site possibly contains about 9,000 buried drums. In March 1977, surface impoundments overflowed and contaminated a local pond and pastures north of the site resulting in a fish kill in the pond and the death of several cattle. Consequently, the site was covered, recontoured, and closed by the State in 1978. Land use around the site primarily consists of pasture land and low density residential areas. Although no residences within a one-half mile radius north of the site depend on private wells for drinking water, several local wells are still used for watering lawns and livestock, a fish pond, and occassionally for domestic uses when the municipal supply is not functional. Four areas of contamination have been identified at the site. Area A is the deepest portion of the strip mine which ran along
(See Attached Sheet)

17. Document Analysis a. Descriptors

Record of Decision
Industrial Waste Control, AR
First Remedial Action - Final
Contaminated Media: gw, sediments, soil, sw
Key Contaminants: metals, organics, VOCs (TCE)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 88
	20. Security Class (This Page) None	22. Price

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R06-88/036
June 1988

PB89-153761

EPA

Superfund Record of Decision:

Industrial Waste Control, AR

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SPRINGFIELD, VA. 22161

EPA/ROD/R06-88/036
Industrial Waste Control, AR
First Remedial Action - Final

16. ABSTRACT (continued)

the entire northern portion of the site, and includes drums containing solidified wastes typically of dried paint and solidified foam. Area B lies south of the strip mine and includes shale spoils from surface mining and random crushed drums. Area C is located in the center of the site and contains two former surface impoundments constructed in 1975 and used as evaporation ponds for bulk liquids. Shale spoils, crushed used drums, landfill debris, and sludge-like sediments were also found in Area C. Area D, located in the extreme southwest corner south of Area B, contains intact, liquid-filled and crushed drums as well as contaminated shale spoil. Approximately 19,500 cubic yards of contaminated soil is located in Area C and D. The primary contaminants of concern affecting the soils, sediments, ground water and surface water include: VOCs including toluene, organics, and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes: installation of a french drain along the south, west and east sides of the site with a synthetic liner or other barrier, such as a slurry wall installed on the site side of the french drain; excavation of Area D liquid-filled drums with offsite disposal; excavation and onsite stabilization of Areas C and D soil with onsite disposal of residual matrix in the Area C excavation pit; categorization of solid and liquid wastes resulting from previous investigations with disposal consistent with Area C and D materials; ground water pump [illegible] offsite treatment, mixture with the contaminated soil and stabilized onsite, or treatment in an onsite facility with discharge to be determined during design; multilayer RCRA capping to cover the area bound by the french drain system and the northern site border; surface water diversion using ditches and berms; access and land use restrictions; and ground water and site monitoring. The estimated present worth cost for this remedial action is $11,400,000.

INDUSTRIAL WASTE CONTROL SITE

RECORD OF DECISION

JUNE 1988

ic

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Industrial Waste Control (IWC) Site, Fort Smith, Arkansas

STATEMENT OF PURPOSE

This decision document outlines the selected remedial action for the Industrial Waste Control site in accordance with the Comprehensive, Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substance Pollution Contingency Plan, 40 CFR Part 300, November 20, 1985.

The State of Arkansas (through the Arkansas Department of Pollution Control and Ecology) has been provided an opportunity to comment on the technology and degree of treatment proposed by the Record of Decision and has concurred with the selected remedy (see Appendix D).

STATEMENT OF BASIS

This decision is based on the administrative record for the Industrial Waste Control site. The attached index (Appendix E) identifies the items which comprise the administrative record.

DESCRIPTION OF THE REMEDY

The major components of the selected remedy include:

- Excavation of buried drums in the southwest corner (Area D) of the site. The liquids from the drums will be removed and transported to an EPA approved offsite RCRA compliant facility for disposal or reuse.

- The contaminated soils from Areas C (former surface impoundments) and D and the area around monitoring well 09B will be excavated, stabilized onsite, and returned to the excavation site in Area C. The stabilized matrix will pass the RCRA Toxicity Characteristic Leaching Procedure (TCLP) and/or other EPA-approved Leachate test as well as the ASTM strength test. A slurry wall will be installed around the stabilized waste to provide long-term security. The extent of soil excavation in Area C and D will be determined during the Remedial Design.

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- o A french drain system will be installed along the south, west, and east sides of the site to intercept and divert shallow groundwater around the site. A synthetic liner or other barrier, such as a slurry wall, will be installed on the site side of the french drain to prevent onsite ground water from migrating into the french drain system.

- o Groundwater encountered during the excavation will be removed and transported to an offsite RCRA compliant facility for treatment and disposal; mixed with the contaminated soils and stabilized onsite; or, treated in an onsite treatment facility. The treatment plant discharge location and effluent limitations would be established by EPA and the Arkansas Department of Pollution Control and Ecology.

- o Solid and liquid wastes resulting from the previous investigations at the site will be categorized during the remedial design with disposal consistent with Area C and D materials.

- o A multilayer RCRA cap will be constructed to cover the area bound on the south, west, and east by the french drain system and on the north by the site boundary.

- o Ditches and berms will be constructed on the south, west and east edges of the site to divert surface water runoff from the site.

- o Impose land use restrictions and install a security fence to maintain the integrity of the Remedial Action and to prevent further development on site.

- o Monitor groundwater onsite and adjacent to the site. Evaluate site every five years for effectiveness of the remedy.

DECLARATION

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate, and is cost-effective. This remedy satisfies the preference for treatment that reduces toxicity, mobility or volume as a principal element. Finally, it is determined that this remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

JUN 2 8 1990
Date

Robert E. Layton Jr.

Robert E. Layton Jr., P.E.
Regional Administrator

ATTENTION

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DIRECT QUESTIONS RESULTING FROM ILLEGIBILITY TO:

U.S. EPA
OSWER - HSCD

Industrial Waste Control Site
Record of Decision Concurrences

The Industrial Waste Control Site Record of Decision has been reviewed and I concur:

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SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

INDUSTRIAL WASTE CONTROL SITE

FORT SMITH, ARKANSAS

JUNE 1988

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION VI, DALLAS, TEXAS

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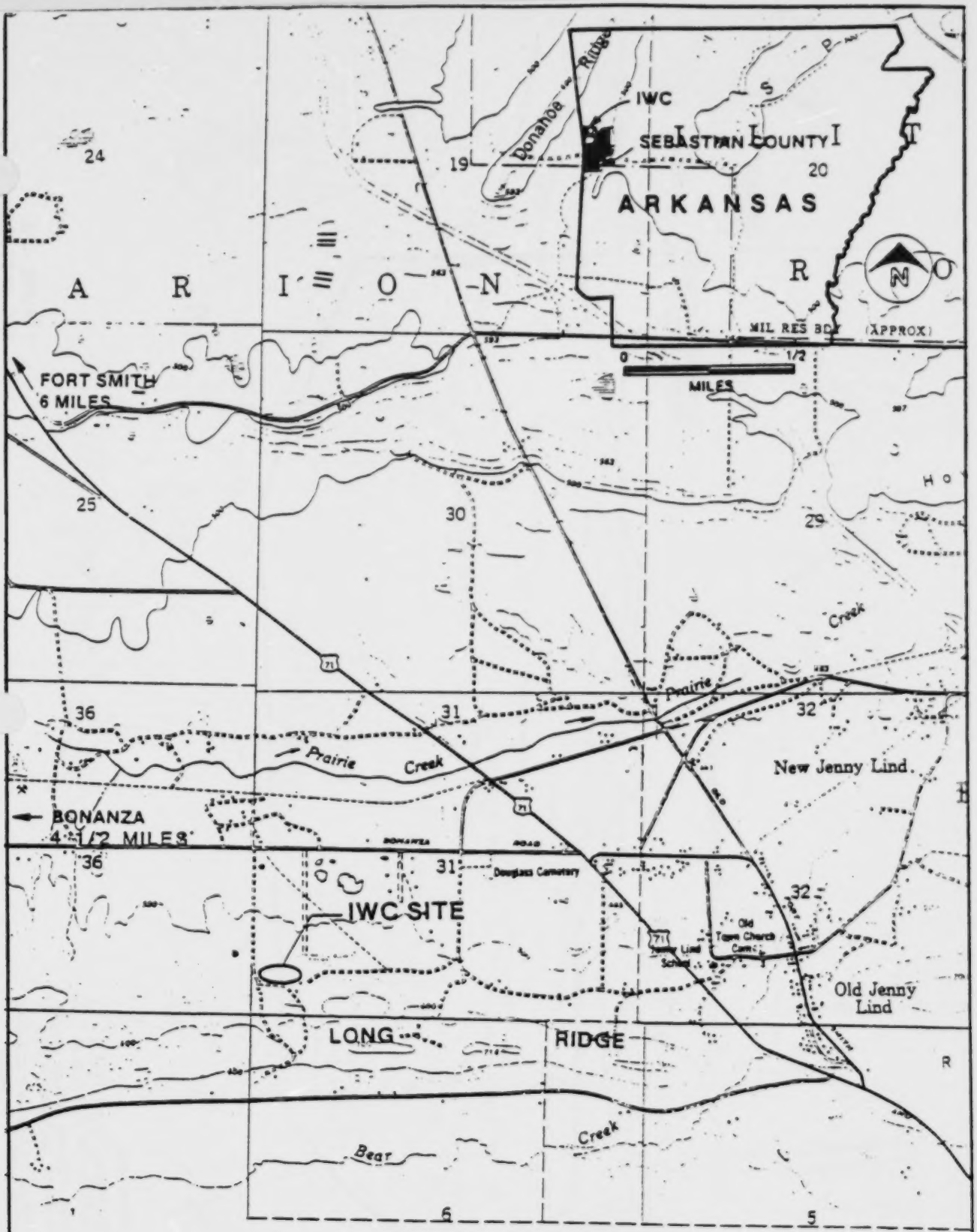

FIGURE - 1
SITE LOCATION
INDUSTRIAL WASTE CONTROL SITE

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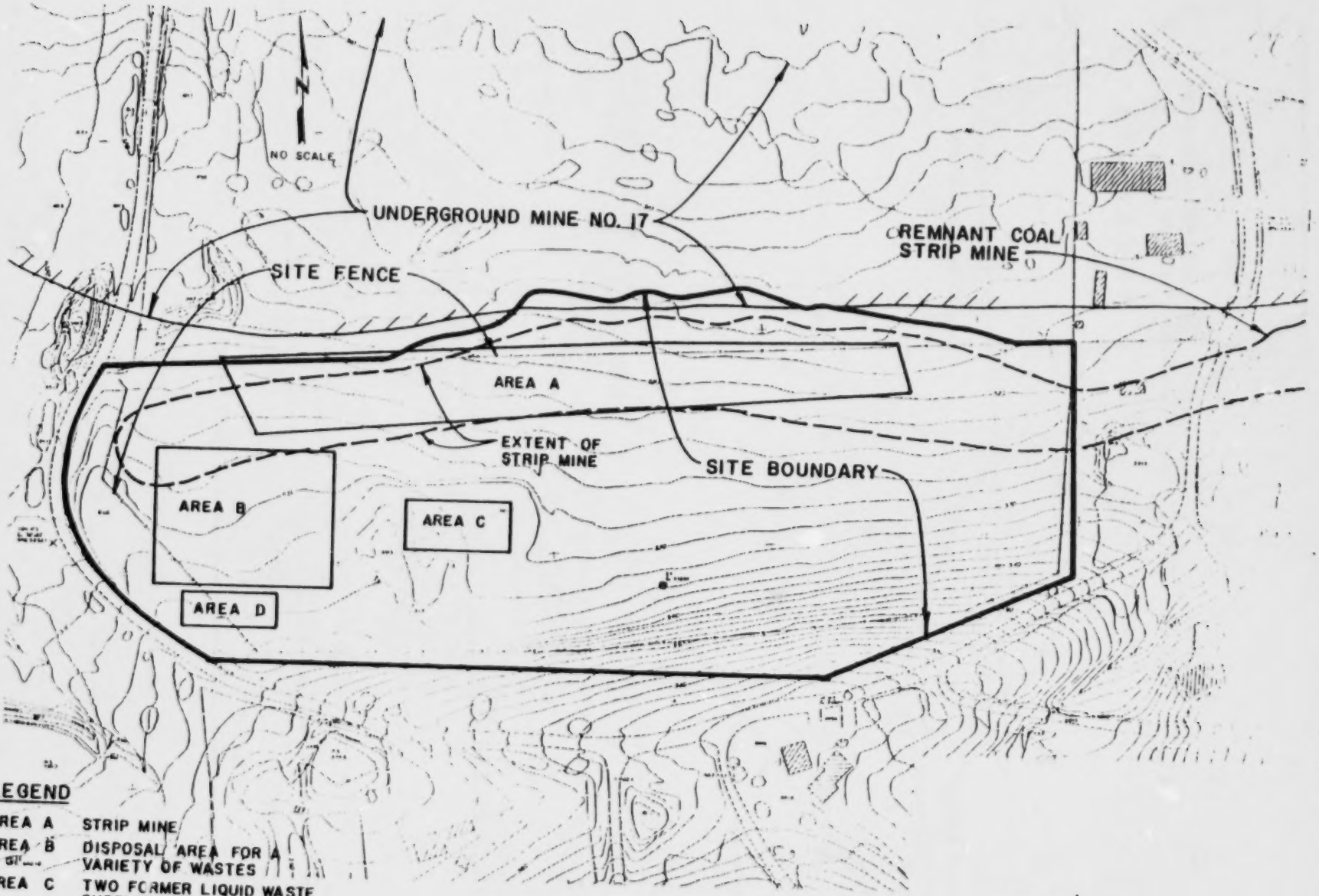

FIGURE – 2
IWC SITE BOU RY
INDUSTRIAL WAST NTROL SITE

1. SITE DESCRIPTION AND HISTORY

The IWC site is a closed and covered industrial landfill about 8 miles southeast of Fort Smith and 1 mile west of Jenny Lind, Sebastian County, Arkansas (Figure 1). The site includes an abandoned coal surface strip mine. Extensive underground mining also occurred immediately north of the site. The underground mining occurred around the turn of the century and surface mining occurred in the 1940s. The area is now primarily pasture land and low density residential areas.

The site (Figure 2), which covers approximately 8 acres, includes the former surface strip mine that ran along the entire northern portion of the site. Waste materials, refuse, construction debris, and fill dirt were placed into the site during the landfill's operating life, from the late 1960s to 1978. At least two surface impoundments were constructed at the site and apparently used as evaporation ponds, and drummed wastes were buried at the site. The IWC Site is now closed, the strip mine has been filled in, and the site is graded to approximately natural contours,

During the 1890s and early 1900s, at least five underground coal mines were operated in the general area just north of the site from Jenny Lind westward toward Bonanza. One of these mines, Mine No. 17, lies immediately to the north and the east of the site. In the 1940s, the same coal seam that was mined underground was strip mined along its outcrop. The western end of this

strip mine was used some 20 years later for the IWC landfilling operation. Activities at the site between the 1940s and 1960s are not well documented, but aerial photographs show that the strip mine remained open and activities did not change the surface topography to any extent. In the late 1960s or early 1970s, James "Dude" Willis began a disposal operation that primarily dealt in refuse and industrial trash. An application for an industrial landfill was filed with and temporarily approved by the Arkansas Department of Pollution Control and Ecology (ADPC&E) in November 1971. Between 1971 and 1974, several local industries used the site for waste disposal purposes.

In August 1974, the site was sold to Grady Shipley. Waste disposal operations continued through 1978, under the name of Industrial Waste Control (IWC), as a state-permitted industrial landfill. Industries in and around the Fort Smith area used the site for the disposal of a wide variety of liquids, solid wastes, and sludges. Available state records indicate that waste liquids such as methylene chloride, phenols, cresylic acid, and paints were disposed of at the site. Surface impoundments for disposal of bulk liquids were constructed, apparently in 1975, and were used as evaporation ponds. At least two and perhaps four or more ponds were constructed at the site. Drummed wastes, both liquids and solids, were also buried at the site.

During March 27 to 29, 1977, heavy rains fell on and near the site, apparently causing the evaporation ponds to overflow. The liquid wastes reportedly

flowed onto property north of the site and, according to testimony in state district court (Henson vs. IWC, 1977), resulted in a fish kill at a farm pond on Mr. Henson's property. Several site inspections by the state were conducted in the spring and summer of 1977 and at least one meeting was held between IWC, local industries, and the state. Closure activities were initiated in mid to late 1977. Mr. Shipley made arrangements with Mr. Henson to use spoil from the earlier strip mining operations as a cover for the landfill. The site was covered, recontoured to approximately natural contours, and closed in 1978.

2. SITE GEOLOGY

The area geology is structurally complex and has been subject to extensive folding and faulting related to formation of the Ouachita Mountains. With the exception of the thin veneer of quaternary-age alluvium along the stream courses and alluvium/colluvium along ridge slopes, all the geologic strata beneath and nearby the site are Pennsylvanian age.

The exact location of the Backbone Fault has been variously interpreted to range from within the bounds of the site to the crest of Long Ridge, approximately 1/4 mile south of the site (Figure 1). However, in all probability, the site area lies within the fault zone associated with the Backbone Fault.

The coal bed mined by surface methods at the site has been mined extensively immediately north of the site by underground methods. Groundwater measurements suggest that there are no extensive direct connections (openings) between the surface and underground mines, however, the Remedial Investigation (RI) and Hydrogeologic and Waste Quantification Study (HWQS) have determined that underground mine voids exist immediately adjacent (30 to 100 feet) to the former strip mine.

The average dip (downward slope) of the coal bed north of the site is between 5 and 6 degrees to the north. Two hundred yards north of the site, the coal seam is approximately 140 feet below the surface. The coal bed was sharply uplifted at the site and may have been exposed at the surface. In the strip-mined area, the coal bed may have been nearly vertical.

The seismic survey defined the northern boundary of the strip mine and delineated the depth of fill within the strip mine. The strip mine depth varies from 40 to 50 feet at the middle of the site to 25 to 35 feet deep at the east and west ends. The bottom of the strip pit consists of fractured shales and interbedded sandstones and shales. There is no evidence that a liner was placed prior to filling operations.

3. GROUNDWATER

There are up to five groundwater-bearing zones of interest near the IWC Site. The zones consist of two separate artesian aquifer systems within the coal

units and related mine workings north and northwest of the site (Artesian System Mine No. 17 and Artesian System Mine No. 18), a shallow perched groundwater system within the strip mine fill, a discontinuous perched zone in the overburden soils and upper portions of the McAlester shale north of the site, and an apparently unconfined groundwater system in the Atoka and/or Hartshorne formations south of the site (Figure 3).

The shallow perched onsite groundwater zone is recharged by seepage through the hillside immediately south of the IWC Site and by direct precipitation. This groundwater zone is apparently not continuous across the entire site, saturated and unsaturated areas being determined to some extent by the density of the backfill and spoils spread over the site. This groundwater zone develops one or more springs during wetter times of the year (primarily in Area C), but probably most often discharges into the underground coal mine voids. The onsite perched groundwater should not be considered a usable aquifer. If a groundwater well were installed in this onsite system (within the limits of the strip mine), it would probably yield less than 0.5 gallons per minute. This onsite shallow groundwater has relatively high concentrations of both organic and inorganic constituents.

The shallow aquifer north of the site in the overburden soils and upper portions of the McAlester Shale is apparently not continuous with the onsite perched system. This aquifer would probably yield adequate water for

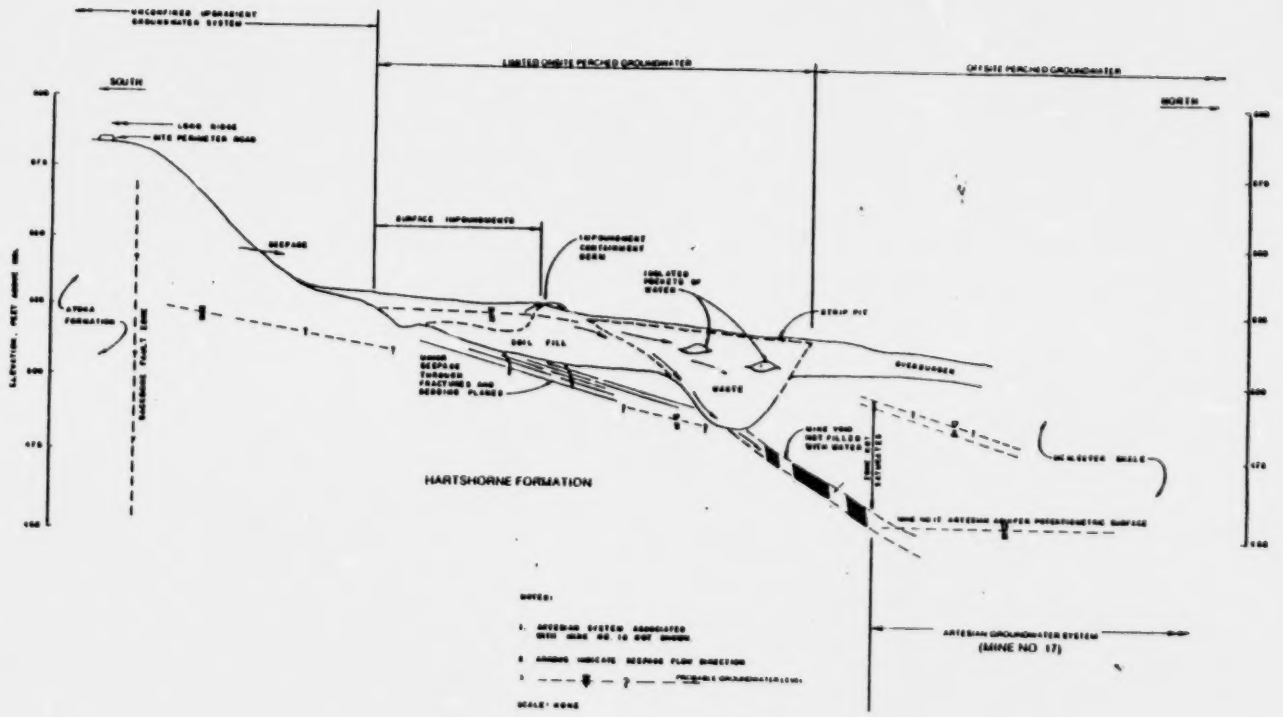

FIGURE 3
GEOHYDROLOGY CROSS SECTION
INDUSTRIAL WASTE CONTROL SITE

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residential use in areas 1/2 mile or so north of the site. Immediately north of the site, however, shallow wells yield very little or no water. This small yield is due to low permeability of the soil, to surficial bedrock units adjacent to the site, and to the lack of an adequate recharge area. The artesian groundwater systems north and northwest of the site are associated with the underground mine workings (Mine Nos. 17 and 18). The artesian system northwest of the site is associated with Mine 18 and is apparently not connected to the site. The potentiometric head in this system is about 30 feet higher than the head in the Mine No. 17 artesian system. Samples of this groundwater showed no contamination. The artesian groundwater system due north of the site is associated with the Mine No. 17 underground mine workings in the area. Groundwater from this system showed very low concentrations of organic and inorganic contamination.

The groundwater system in the Atoka and Hartshorne formations south of the site is upgradient to the site and most likely discharges groundwater onto the site via the hillside at the site's south edge. This groundwater system may also discharge water into bedrock formations that lie below the site.

Elevated concentrations of inorganics (above published background levels) were detected in the unconfined groundwater system south of the site, but these are not attributable to the disposal activities at the site because this system is

upgradient to the onsite perched system. The interrelationship between the two systems is not known.

Based on the information gathered in the RI and HWQS, both the onsite and adjacent offsite regions of the perched groundwater system may be Class 3 aquifers (groundwater not a potential source of drinking water and of limited beneficial use) under the proposed U.S. EPA groundwater strategy because the potential water yield would likely be inadequate for residential or commercial/industrial use. Where the offsite perched groundwater system actually becomes a usable water supply cannot be accurately defined, but it is definitely greater than 200 feet from the site boundary.

At some point north of the site, the perched groundwater system does provide sufficient yield to support residential or light commercial/industrial use. The downgradient usable region of the perched groundwater system and the artesian aquifer associated with Mine No. 17 likely would be classified as Class 2 groundwater by EPA (current and potential sources of drinking water having other beneficial uses).

4. NATURE AND EXTENT OF PROBLEM

4.1 Waste Types and Location

Data on the waste materials disposed at the IWC site were compiled from EPA project files and by reviewing court testimony and written court interrogatories presented during the Henson versus IWC court proceedings

in 1979. Although disposal records and copies of all trucking manifests were not maintained, a general list of chemicals and types of wastes disposed at the IWC site has been compiled and is summarized in Table-1:

TABLE - 1

LIST OF WASTES REPORTEDLY DISPOSED AT THE IWC SITE

Methylene chloride	Cutting oils
Trichloroethene	Paint thinners
Sodium hydroxide	Lacquer thinners
Acetone	Hydraulic oils
Chromium sulfate	Kerosene
Zinc phosphate	Phosphate sludges
Cresylic acid	Inks
Methyl ethyl ketone	Water-soluble oils
Methanol	Paints
Butyl cellosolve	Alkaline flotation agents
Toluene	Packing materials
Stannuous octoate	Plastics
Phenols	Foam rubber

The results of the RI and HWQS indicate four main areas of the IWC site where wastes were disposed (Figure 2). A physical description of each area and the types of waste found is summarized below:

(1) Area A. Area A is the deepest portion of the strip mine, varying in depth from 25-35 feet on the east and west ends to 40-50 feet near the middle of the site. Generally, this area was dry, but localized pockets of perched water exist throughout the area. Most drums were encountered in the upper 15 feet below which the waste consisted of wood and trash. Many drums contained solidified material typical of dried paint and solidified foam. But empty and

crushed drums were also found. No liquid-filled drms were encountered in Area A. Chemical analysis showed elevated levels of both organics and inorganics in the drummed material. Analysis of soil samples from the western half of Area A revealed higher organic concentrations than the eastern half. Elevated levels of several inorganics were also documented across the area.

(2) Area B. Immediately south of the strip pit, this area varies in depth from 20 feet on the north to approximately 15 feet on the south. The area consists primarily of shale spoils from surface mining with some debris. The area was relatively dry, but several very moist zones were encountered. Volatile organic contaminants were evident in borings, from very shallow depth to bedrock. Elevated levels of several heavy metals were also confirmed. Random crushed, empty drums were encountered at and immediately below the surface.

(3). Area C. Area C is the location of two former impoundments for bulk liquids. Aerial photographs from 1976 document the location and size of the impoundments. Evidence of the impoundment berm is still visible. The area is approximately 15 feet deep. Material in the area consists of shale spoils, crushed drums some of which contained solidified foam and paint sludge or epoxy material, landfill debris, and sludge-like sediments. Perched pockets of water were encountered throughout this area, including an area where a black oily liquid was encountered. Elevated levels of both organics and inorganics

were confirmed. Area C is considered a principal source of the contaminants in Area A immediately to the north.

(4) Area D. Area D is the location where below grade, intact, liquid-filled and crushed drums were found. The depth of the area was not confirmed, but it is at least 6 feet deep with possibly two distinct areas of drum disposal. The liquids in the drums were observed to be black and brown with odors reminiscent of wood lacquers, varnishes, and paint thinners. Shale spoil surrounding the buried drums is also contaminated. Area D is considered a principal source of the organic contaminants in Area B and the west end of Area A.

4.2 Groundwater Systems

There are five groundwater bearing zones near the IWC site (Figure 3): an unconfined upgradient system, a limited perched onsite system, a discontinuous perched zone north of the site, and artesian systems in the two underground mines north of the site. The systems are briefly described below:

(1) Unconfined Upgradient System: The unconfined system was identified south of the site within the same bedrock units that underlie the site. Several residential wells are completed in this system. This system is upgradient and is not believed to be interconnected with the perched groundwater onsite. Ground water within the unconfined system is believed to move along bedding planes and migrate down dip in the bedrock and below the base of the strip mine.

(4) Artesian Groundwater System - Mine No. 18. There are two separate groundwater systems within the coal unit and underground mine workings north of the site (Figure 2): a system associated with Mine No. 18 and a system associated with Mine No. 17. Mine No. 18 is northwest of the site and is apparently not physically connected to Mine No. 17. The Mine No. 18 system has an artesian pressure approximately 30 feet higher than the system in Mine No. 17. The recharge source for the Mine No. 18 system is west and northwest of the site and there is no apparent connection between this system and the site. Samples of groundwater from this system showed no contamination.

(5) Artesian Groundwater System - Mine No. 17. Mine No. 17 is immediately north of the site. The recharge for this system is to the north and northeast of the site. Prairie Creek has been documented a recharge source. Leakage and seepage downward from the offsite perched and offsite unconfined groundwater systems north of the site are potential minor sources of recharge. The aquifer in Mine No. 17 is a usable groundwater resource. Two wells were identified during the residential well survey which are probably completed in this artesian system although this could not be confirmed. These two wells are over 1/4-mile from the site, are not currently in use, and are not contaminated. There is evidence of limited seepage or leakage from the contaminated onsite perched system into the Mine No. 17 artesian system. The leakage

(2) Limited Onsite Perched System. Generally, the eastern portion of the site is saturated with groundwater. The western portion contain limited perched groundwater zones. The strip mine (Area A) is relatively dry with isolated pockets of water existing within the miscellaneous waste. The recharge for the onsite perched system is mainly surface water infiltration with some seepage from the hillside south of the site. This system is presently contaminated in excess of acceptable limits for use as a drinking water source. However, because of its low-yield it is not considered a usable source. The major concern with this system is that the majority of the seepage and groundwater flow from this system is into the Mine No. 17 artesian aquifer immediately north of the site which is a usable source.

(3) Perched Zone North of the Site. The investigations north of the site identified the presence of a perched zone within the overburden soils and the uppermost portion of the McAlester shale north of the site. Recharge for this system is primarily from precipitation and surface water infiltration on the area north of the site. This system may become unconfined further north of the site where there are at least two wells completed in this zone. The wells are not currently used for domestic supplies but are still capable of being used. It is not likely that the offsite perched system is hydraulically connected to the onsite system, although low levels of contamination is probably the result of past events at the site (e.g., impoundment overflow in 1977) rather than present releases.

occurs at the base of the strip pit where the coal seam and mine workings are interconnected to the strip mine. Samples of the artesian system adjacent to the site showed very low levels of organic and inorganic contamination.

4.3. Surface Water, Soils, and Sediment

Surface drainage from the site is primarily north into Prairie Creek approximately 1/2 mile north of the site. Surface runoff flows predominantly as unchanneled flow with some localized drainage ways. Surface runoff from higher areas south of the site, such as Long Ridge, can flow onto and across the site. Localized ponding exists at a depression onsite in the area of one of the old surface impoundments. Although Prairie Creek is classified by the Arkansas Department of Pollution Control and Ecology as a drinking water source, no residential use of this water was identified in the survey area.

Organic contamination and elevated levels of inorganics were detected in soils and sediments onsite. The highest concentrations and highest number of constituents were found in Areas B, C and D and on the western third of the site. Surface soil contamination on the eastern third of the site is much lower.

Offsite organic and inorganic contamination of soils decreases both in number of contaminants and in concentration with distance from the site. The elevated levels offsite are most likely the result of past surface releases during the operation of the evaporation ponds.

Surface seeps at the site in the area of the former impoundments provide a potential for release of additional contamination into the surface drainage pathways. Surface soil and sediment of the seep are heavily stained.

However, chemical analysis of the material in the existing seep does not indicate concentrations of contaminants above background levels established for the site. The existence of buried drums in this area (Area C), however, provides a potential source of contaminants that could be released into the groundwater and into this seep at any time in the future.

Surface water samples from Prairie Creek and three farm ponds show no contamination. Sediment samples from Prairie Creek upstream, directly north and downstream of the site exhibited levels of barium, chromium, and magnesium above background levels established for the site. The concentrations increased from upstream to downstream sampling stations. The elevated levels of these heavy metals in the stream sediments downgradient from surface runoff at the site may be the result of past activities at the site or may come from some unknown source. Existing levels of these elements in onsite and near-site soils do not indicate that the soils at the site are the present source of the elevated levels of barium, chromium, and magnesium in stream sediments.

5. HEALTH AND ENVIRONMENTAL RISKS AT THE SITE

The perched onsite groundwater is presently contaminated in excess of acceptable limits for use as a drinking water source. However, this system does not have sufficient yield to be used as a drinking water source. This system is a concern because of the apparent leakage into the artesian (Mine No. 17) system north of the site, which is a usable source.

The Endangerment Assessment (EA) results indicate that the artesian groundwater system may present a potential human health risk due to noncarcinogenic contamination from manganese and carcinogenic contamination from arsenic, bis(2-ethylhexyl) phthalate, methylene chloride, and N-Nitrosodiphenylamine. The arsenic and manganese levels are considered indigeneous to the coal mined area and the low concentration of listed organics detected may be associated to some degree with laboratory contamination. Thus no remediation is considered appropriate for this aquifer, although it should be protected from further contaminated seepage from onsite.

The potential for human exposure to contaminants from the IWC site was assessed in the EA using four potential use settings, assuming no remedial action at the site; residential development, light industrial/commercial development, recreational use, and agricultural use. Health risks under the agricultural use setting was not quantified because the extent of exposure is difficult to predict. Use of the site and land adjacent to the site by children

under the residential and recreational development settings results in health risks by soil ingestion. Health concerns include noncarcinogenic toxic effects as a result of exposure to several heavy metals including cadmium, lead, manganese, and nickel. Maximum concentrations of these metals are in excess of the acceptable daily intake in both onsite and offsite soils. However, the offsite levels might be a result of the previous mining activity in the area rather than the waste disposal operation. Therefore, no remediation is proposed for offsite soils. None of the daily intakes for soil calculated for adults exceeded acceptable intakes for noncarcinogenic contaminants.

Carcinogenic chemicals such as trichloroethene, bis(2-ethylhexyl) phthalate and methylene chloride exist in onsite waste and in offsite soils at levels which present a chronic excess lifetime cancer risk if ingested. This would occur under both the residential and commercial land use settings. Concentrations of carcinogic chemicals in offsite soils appear to be limited to levels that are naturally occurring, such as the relatively low concentration of arsenic. Onsite carcinogenic chemicals are at higher levels than at offsite locations, and are associated with waste disposed on the site.

It is estimated that there may be as many as 9,000 drums buried at the site. This includes intact drums containing free liquid as well as solid-filled and crushed empty drums. The liquid filled drums, found only in Area D during the HWQS, are one of the principal sources of contamination at the site and can

continue to release wastes which could:

- o Hasten corrosion of nearby drums, with a resulting increase in hazardous constituents and/or concentrations in soil and groundwater.
- o Release additional chemicals to the groundwater, resulting in increased solubilization and mobility of existing contaminants.
- o Increase the potential health hazard from unknown chemicals.
- o Disrupt the integrity of the fill material and bedrock presently limiting migration rates.
- o Potentially increase the toxicity of the leachate seeps, thereby increasing the health risk of exposure to onsite soils.

Buried drums containing solid material are scattered throughout the site. The solids in the buried drums pose a lesser threat than the liquids for contaminating surrounding media because of the nature of the solids in the drums and their relatively low mobility potential. However, some contaminants can be expected to migrate from these drums as a result of leaching. Exposure to contaminants can also result if excavation of the area were to occur which would cause the solids to be brought to the surface.

There is limited potential for impacts on animal and plant populations at the IWC Site. Currently, any use of the IWC Site by animals is generally limited and temporary, with the possible exception of rodents (i.e., field mice). Offsite migration and impact potential are minimal. The impact on plants and

animals on the site should be buffered by the generally good ecological quality of the surrounding area.

6. ENFORCEMENT HISTORY

CERCLA §104(e) information request letters were mailed in 1983 and 1984 to Potentially Responsible Parties (PRPs). Approximately 20 PRPs have been identified. Several of the PRPs have formed a Steering Committee (IWC Steering Committee) to coordinate their efforts for site cleanup.
An Administrative Order on Consent was issued in February 1987 to the IWC Steering Committee members to allow them to conduct supplemental field studies in summer 1987. General notice letters were sent to the PRPs prior to the public meeting on May 9, 1988. Special notice letters specifying the negotiations moratorium were mailed on June 24, 1988.

The IWC Steering Committee has expressed interest in performing the Remedial Design/Remedial Action under the terms of a Consent Decree. Negotiations are underway to accomplish this objective.

7. COMMUNITY RELATIONS HISTORY

Community interest in the Industrial Waste Control site has been moderate. Adjacent property owners have been aware of the site since the early 1970s. Media coverage of the site has not generated an increase in local interest.

Upon completion of the feasibility study in the summer of 1986, EPA distributed a fact sheet regarding the results of the remedial investigation and the feasible alternatives for clean-up. Thirty-seven citizens attended a public meeting on July 1, 1986. In March and December of 1987, EPA issued updates advising the citizens of the Steering Committee's supplemental study. No additional concern/questions or comments were generated as a result of these two updates.

On April 19, 1988, EPA announced its proposed plan of action, based upon the findings of the revised Feasibility Study. The public comment period from May 2 to June 2, 1988 was also announced. An estimated 35 area citizens and local officials attended the meeting on May 9, 1988. Overall, the residents and local officials do not oppose the proposed plan. Responses to the comments received during the comment period are outlined in Appendix C entitled "Responsiveness Summary."

8. ALTERNATIVE EVALUATION

8.1 Evaluation Criteria

Section 121 of SARA contains nine factors which U.S. EPA must consider in selecting a remedy for a Superfund site. These items are listed below:

1. Consistency with Other Environmental Laws

In determining appropriate remedial actions at Superfund sites, U.S. EPA must consider the requirements of other Federal and State environmental laws, as well as CERCLA as amended by SARA. Primary consideration is given to attaining applicable or relevant and appropriate Federal and State public health and environmental laws, regulations and standards (ARARs). Not all Federal and State environmental laws and regulations are applicable to each Superfund remedial action.

2. Reduction of Toxicity, Mobility or Volume

U.S. EPA must assess the degree to which remedial alternatives employ treatment that reduces toxicity, mobility, or volume of hazaradous wastes. The relevant factors include:

- o The treatment processes, the proposed remedies employed and the materials they treat;
- o the amount of contaminated materials destroyed or treated;
- o the degree of expected reduction in toxicity, mobility, or volume;
- o the degree to which the treatment is irreversible; and
- o the residuals that will remain following treatment after considering the persistence, toxicity, mobility, and propensity for bioaccumulation of such hazardous substances and their constituents.

3. Short-term Effectiveness

U.S. EPA must assess the short-term effectiveness of an alternative by considering the following:

- o Magnitude of reduction of existing risks; and
- o probable short-term risks to the community, workers, or the environment during the implementation of an alternative including potential threats associated with excavation, transportation, and redisposal or containment.

4. Long-term Effectiveness and Permanence

U.S. EPA must assess for each alternative the long-term effectiveness and permanence they afford along with the degree of certainty that the remedy will prove successful. The relevant factors include:

- o Magnitude of residual risks in terms of amounts and concentrations of wastes remaining following implementation of a remedial action, considering the persistence, toxicity, mobility, and propensity for bioaccumulation of such hazardous substance and their constituents;
- o type and degree of long-term management required, including monitoring and operation and maintenance;
- o potential for exposure of human and environmental receptors to remaining waste considering the potential threat to human health and the environment associated with excavation, transportation, redisposal, or containment;

- o long-term reliability of the engineering and institutional controls, including uncertainties associated with the land disposal of untreated wastes and residuals; and
- o potential need for replacement of the remedy.

5. Implementability

U.S. EPA must assess the ease or difficulty of implementing the alternatives by considering the following factors:

- o Degree of difficulty associated with constructing the solution;
- o expected operational reliability of the treatment technology;
- o need to coordinate with and obtain necessary approvals and permits (or meet the intent of a permit for Superfund actions);
- o availability of necessary equipment and specialists; and
- o available capacity and location of needed treatment, storage, and disposal services.

6. Costs

U.S. EPA must access the following types of costs:

- o Capital costs:
- o operation and maintenance costs;
- o net present value of capital and operation and maintenance cost; and
- o potential future remedial action costs.

7. Community Acceptance

U.S. EPA must assess the concerns of the community including:

- o Components of remedial alternatives that the community supports;
- o features of the alternatives about which the community has reservations; and
- o elements of the alternatives which the community strongly opposes.

8. State Acceptance

U.S. EPA must access the concerns of the state government which for this site is represented by the Arkansas Department of Pollution Control and Ecology. This assessment includes:

- o Components of remedial alternatives that the State supports;
- o features of the alternatives about which the State has reservations; and
- o elements of the alternatives which the State strongly opposes.

9. Overall Protection of Human Health and the Environment

Following the analysis of the remedial options against individual evaluation criteria, U.S. EPA must also assess whether the remedial alternatives provide adequate protection of human health and the environment. U.S. EPA is also directed by Superfund law (SARA) to prefer solutions that use treatment to permanently remove contaminants from the environment. Offsite transport and disposal without treatment is the least preferred option when practicable treatment technologies are unavailable.

8.2. Description of Alternatives

Table 2 lists the alternatives, the technologies included and the costs (present worth).

Alternative 1 - NO ACTION

No remedial actions are taken, and the site would remain in its present condition. This alternative, required by the NCP and SARA, is a baseline against which the effectiveness of other alternative remedies are judged. The RI derived wastes which have been determined hazardous would be disposed at an offsite EPA approved facility. The nonhazardous portion of this RI waste would be placed on the site. The site would be left in the same condition as existed prior to the RI, with the exception that the monitoring wells would remain.

Estimated Cost $0.16 Million

Alternative 2 - CONTAINMENT WITH GROUNDWATER CONTROLS, RIGID BARRIER AND AREA D DISPOSAL

Alternative 2 consists of continued monitoring, surface water diversion, site security fence, multilayer cap, french drain, excavation and offsite disposal of Area D materials, and land use restrictions enforced by the PRPs. A rigid barrier is constructed in the mine voids north of the site. The drum disposal area (Area D) is excavated and the materials taken offsite for disposal in lieu of containment, and the PRPs will purchase the site to enforce land use restrictions. There are an estimated 3,000 liquid-filled and crushed drums in

Table 2

SUMMARY OF REMEDIAL ALTERNATIVES

IWC SITE, ARKANSAS

REMEDIAL ACTION	ALTERNATIVES					
	1	2	3	4	5	6
NO ACTION	•					
SITE USE LIMITATIONS		•	•	•	•	
SITE FENCED		•	•	•	•	
SURFACE WATER DIVERSIONS		•	•	•	•	
GROUNDWATER MONITORING		•	•	•	•	
FRENCH DRAIN		•	•	•		
CLAY CAP		•	•	•		
MULTILAYER CAP				•		
SLURRY WALL (STABILIZED WASTES)		•	•		•	
RIGID BARRIER			•			
AREA D DRUMS—EXCAVATE/OFFSITE DISPOSAL		•				
ONSITE STABILIZATION—AREAS C AND D		•	•		•	
ONSITE INCINERATION—AREAS C AND D			•			
ONSITE CONTAINMENT—TOTAL SITE				•		
ONSITE INCINERATION—TOTAL SITE					•	
ESTIMATED COSTS (MILLIONS)	0.16	17.7	11.4	34	17.6	• 146

Area D. The excavated liquids would be sampled and tested for compatibility. Compatible and incompatible wastes would be separated, placed in bulk tanker trucks, and disposed at an offsite, RCRA compliant incineration facility. The surrounding soil contaminated by leaking drums or by the drum extraction process will also be excavated and disposed offsite in compliance with RCRA regulations. A rigid barrier consisting of sheet pile formwork and grout will be constructed along the north side of the site to prevent potential contaminant migration from entering the mine voids and contaminating the artesian aquifer. A multilayer cap would be constructed over the site to the extent of the french drain on the south, east and west sides. The multilayer cap would essentially eliminate the quantity of precipitation which infiltrates into the onsite perched groundwater system. The reduced volume of infiltration would substantially reduce the hydraulic driving force to move the contaminated perched groundwater offsite into the Mine No. 17 artesian aquifer. Surface water will be intercepted and diverted around the site by diversion ditches along the south, east, and west sides of the site. This will protect the multilayer cap from surface water erosion.

Estimated Cost and Construction Time: $17.7 Million and 18 to 24 Months.

ALTERNATIVE 3 - ADDITIONAL CONTAINMENT WITH GROUNDWATER CONTROLS AND "HOT" SPOT TREATMENT (STABILIZATION)

Alternative 3 consists of continued monitoring, surface water diversion, site security fence, multilayer cap, french drain, excavation and onsite

stabilization of Areas C and D soils, offsite disposal/reuse of area D liquid-filled drums, slurry wall constructed around the stabilized waste area, and land use restrictions. Area C contains approximately 200 solid-filled and crushed drums, and 16,900 cubic yards of contaminated soil; Area D contains approximately 3,000 liquid-filled and crushed drums, and 2,600 cubic yards of contaminated soil. Liquid filled drums in Area D would be disposed in an offsite in a EPA approved RCRA compliant facility. The contaminated soil, and solids (to be shredded) will be mixed and stabilized with a mobile stabilization unit. The stabilized matrix, after passing appropriate leachability and strength tests, will be returned to the Area C excavation pit. The empty drums will be crushed and placed into the excavation pit. After the stabilized soil is replaced in the excavation pit and the french drain system installed, a multilayer cap will be installed over the site. The multilayer cap would prevent contact with contaminated surface soils and essentially eliminate infiltration into the fill.

Restrictions on the use and development of the site would be required since hazardous waste is left onsite and to maintain the integrity of the french drain and cap. These would be accomplished in the form of controls on the use and development of the site. Because the long-term reliability of organic stabilization has not been established, the slurry wall will provide additional containment of the stabilized waste thereby further reducing the potential for future migration. In addition, monitoring wells would be installed inside and

just downgradient of the slurry wall system to monitor the effectiveness of the containment and to provide early warning of contaminant migration. The wells inside the system would monitor the level of groundwater and be utilized as a means to remove groundwater, if required, to prevent the accumulation of water within the containment. The presence of groundwater would indicate the containment components are not working effectively and additional containment or replacement may be warranted. All wells would be sampled periodically, if water is present, to indicate the long-term effectiveness of stabilization and the slurry wall.

Estimated Cost and Construction Time: $11.4 Million and 18 to 24 Months.

ALTERNATIVE 4 - CONTAINMENT WITH GROUNDWATER CONTROLS AND "HOT" SPOT TREATMENT (ONSITE INCINERATION)

Alternative 4 consists of continued monitoring, surface water diversion, site security fence, clay cap, french drain, excavation and onsite incineration of Areas C and D wastes, and land use restrictions. A mobile incinerator will be set up onsite to incinerate drum contents determined to be hazardous and contaminated soil excavated with the drums. The individually intact drums will be excavated, tested, and incinerated. The incineration residue would be fixed to immobilize the inorganics and returned to the site and covered with a clay cap. The liquid portion of the investigation derived waste and water encountered during excavation would be treated on site with a temporary water treatment system prior to discharge to a nearby drainageway.

Incineration will eliminate organics as contaminants of concern. Incineration does not affect inorganics. However, the inorganic ash will be fixed and buried rendering them immobile and with little potential for future migration offsite. Since inorganic contamination would remain on site, land development restrictions would be required. These restrictions would preclude future use of the site. Continued monitoring of the artesian groundwater system for inorganic contamination would be required.

Estimated Cost and Construction Time: $34 Million and 30 to 36 Months.

ALTERNATIVE 5 - COMPLETE EXCAVATION AND ONSITE DISPOSAL

An onsite RCRA-type landfill would be constucted for storing and securing contaminated onsite soil, solid wastes in buried drums, and the solid portion of the RI derived wastes that can be landfilled. All waste posing a cancer risk greater than 1×10^{-6} and all waste exceeding the reference doses for noncarcinogens by ingestion would be excavated and placed into the landfill. The drummed liquid waste and surrounding contaminated soil would be excavated and incinerated offsite. The liquid portion of the investigation dreived wastes that is considered hazardous, and water encountered during excavation of the contaminated soil would be treated with an onsite treatment unit and discharged to the artesian aquifer. Sludges generated during the treatment would also be placed in the RCRA vault. The landfill would be constructed in substantial compliance with RCRA requirements for a land disposal facility.

A site security fence would be installed around the site. Land development restrictions would be required since the hazardous waste is left on the site and to ensure the integrity of the landfill. These restrictions would preclude future use of the site. A surface water diversion ditch will be constructed around the south, east, and west sides of the site to divert overland surface water flow around the site to maintain the finished grade of the site. The remainder of the site would be regraded, with clean native material added as necessary to restore a suitable finished grade. Monitoring of the groundwater and the leachate collection and detection systems would be conducted to comply with RCRA requirements.

Estimated Cost and Construction Time: $17.6 Million and 24 to 30 Months.

ALTERNATIVE 6 - COMPLETE EXCAVATION AND ONSITE INCINERATION

Contaminated onsite soils, waste, and buried drums posing a cancer risk greater than 1×10^{-6} and exceeding the reference doses for noncarcinogens by ingestions under the residential setting would be excavated, field analyzed, and incinerated in an onsite mobile incineration unit. The RI derived waste and the sludge from the onsite water treatment plant would also be incinerated. The incinerator ash is anticipated to contain unacceptable levels of inorganics to allow for direct land disposal. It is assumed that the ash will be transported to an offsite RCRA approved landfill.

The areas will be excavated and the materials temporarily stored in pre-fabricated metal buildings to reduce fugitive emissions and then fed to the incinerator.

Scrubber water, following treatment, will be discharged with the treated water from the onsite groundwater treatment system or consolidated with the incinerator ash. The ash will be transported to an offsite RCRA landfill.

The excavated areas would be backfilled with clean native material, graded to drain, and revegetated. The RI derived waste that is suitable for incineration would be incinerated while the liquid portion would be treated at the onsite treatment facility and discharged to the Mine No. 17 artesian system or to a drainage ditch.

Estimated Cost and Construction Time: $146 Million and 30 to 36 Months.

In alternatives 2 through 6, groundwater encountered during the excavation will be removed and transported to an offsite EPA approved, RCRA compliant, facility for treatment and disposal; mixed with the contaminated soils and stabilized onsite; or treated in an onsite treatment facility. Solid and liquid wastes resulting from the previous investigation at the site will be categorized with disposal consistent with the disposition of Area C and D materials. Similarily, the area around monitoring well 09B will be excavated. Contaminated soils and groundwater will be handled with the Area C and D materials.

8.3 Evaluation of Alternatives

The degree to which the remedial alternatives meet the nine selection criteria is contained in Table 3. The following values were assigned to compare remedy selection criteria:

Table 3

Comparison of Alternatives - IWC Site

CRITERIA	ALTERNATIVE					
	1	2	3	4	5	6
Complies with ARARs	--	0	0	0	0	0
Reduces Toxicity	--	0	+	+	0	++
Reduces Mobility	--	0	+	+	++	++
Reduces Volume	--	0	+	+	0	++
Short-term Effectiveness	+	-	0	0	-	-
Long-term Effectiveness	--	0	0	0	0	++
Implementability	++	-	0	0	-	-
Cost in Million $ (Present Worth)	0.16	17.7	11.4	34	17.6	146
Community Acceptance	--	0	0	0	0	0
State Acceptance	--	0	+	0	0	0
Protectiveness	--	+	+	+	++	++

ALTERNATIVE

1- No Action
2- Containment, groundwater controls, rigid barrier, offsite disposal of Area D drums.
3- Containment, Stabilization of Areas C and D, groundwater controls
4- Containment, onsite incineration of Areas C and D, groundwater controls
5- Complete excavation and onsite disposal in a RCRA vault.
6- Complete excavation and onsite incineration.

Symbols

++ = Compared to others, alternative greatly exceeds criterion.
+ = Compared to others, alternative exceeds criterion.
> 0 = Alternative can be designed to meet the criterion.
- = Compared to others, alternative will need special efforts to meet the criterion.
-- = Compared to others, alternative would have the most difficulty in meeting the criterion.

++ Alternative would greatly exceed a selection criterion when compared to other alternatives.

+ Alternative would exceed a criterion in comparison to other alternatives.

o Alternative can be designed to meet the selection criterion.

- Special efforts will be necessary in the design of the remedy to meet the selection criterion.

-- In comparison to the other remedies, these alternatives would present most difficulty in achieving a selection criterion.

The Rationale for the ratings assigned in Table 3 is as follows:

1. Complies with ARARs

No action was assigned a "--" because it violates the intent of SARA Section 121 regarding the selection of a remedy that is protective of human health and the environment.

All other alternatives were rated "o" since they all can be designed to meet the ARARs established for the IWC Site.

2. Reduces Toxicity, Mobility, and Volume

No action was rated "--" because it does not reduce any of those parameters.

Alternative 2 was rated "0" since toxicity is reduced by incineration reuse of Area D liquid-filled drums, mobility of onsite contaminants is reduced indirectly by installation of containment system (french drain, rigid barrier and cap) and the volume of the waste remains essentially the same.

Alternatives 3 and 4 were rated "+" since toxicity is reduced for materials in both Areas C and D, mobility of wastes is reduced by installation of containment system and slight reduction of volume of the wastes occurs.

Alternative 5 was rated "0", ++, 0" since the toxicity and the volume of the waste remains the same in the RCRA vault and the mobility of all site wastes is reduced by the vault system.

Alternative 6 was rated "++" since incineration completely reduces the toxicity mobility and volume of the waste.

3. Short-Term Effectiveness

No action alternative was rated "+" since there are no risks associated with construction.

Alternative 3 and 4 were rated "0" because the short-term risks associated with construction is moderate in comparison to risks associated with Alternatives 2,5, and 6.

Alternatives 2,5, and 6 were rated "-" because of increased risks to construction workers and nearby residents from extensive construction activities (such as

construction of rigid barrier for the mine voids and large scale excavation for RCRA vault or incineration).

4. Long-Term Effectiveness

No action was rated "--" because of the potential human health and the environmental risks involved in leaving untreated wastes at a site where long-term site control cannot be insured.

Alternative 2,3,4, and 5 were rated "0" since these remedies would still involve long term monitoring and maintenance, even though the toxicity, mobility and volume of wastes is reduced.

Alternative 6 was rated "++" since it would remove all contaminants from the site.

5. Implementability

No action was rated "++" since it can be easily implemented.

Alternatives 2, 5 and 6 were rated "-" because of difficulty involved in the construction of a rigid barrier in mine voids, construction of a RCRA vault and excavation and incineration of large quanity of wastes.

Alternatives 3 and 4 were rated "0" since they are complex alternatives but still relatively easy to construct and implement.

6. Cost

The cost for Alternative 1 is low; the relative cost for Alternative 3 is moderately low; The cost for Alternatives 2 and 5 are moderate; The cost for Alternative 4 is moderately high; while the cost for Alternative 6 is the highest in comparison to other alternatives.

7. Community Acceptance

Based upon the two public meetings and comments received, it is evident that the local residents want a solution to the problem. The proposed remedy, therefore, is considered to be acceptable to the community. The public expressed no opposition.

No Action was rated "--" since it is not acceptable to the Community. The remaining alternatives were rated "0" since they are acceptable to the community.

8. State Acceptance

No Action was rated "--" since it is not acceptable to the State. Since the State is favorable to the proposed remedy (Alternative 3) it was rated "+" while the remaining alternatives were rated "0".

9. Protectiveness

No action was rated "--" because it does not provide protection from the potential risks involved with leaving untreated wastes on site. Alternative 2,3, and 4 were rated "+" since risks are reduced by treatment and containment systems.

Alternatives 5 and 6 were rated "++" since all the wastes on site would either be placed in a RCRA vault (Alternative 5) or destroyed by incineration (Alternative 6), thereby minimizing the health risks.

10. Selected Remedy

Based on the information contained in the Administrative Record and the results of the evaluation of Alternatives (Section 8.3), Alternative 3 (Figure 4) has been selected as the remedy for IWC site cleanup.

Construction activities for the selected remedy would probably commence with installation of the french drain system to prevent upgradient groundwater from entering the site and complicating excavation in Areas C and D. Area D drums would be excavated and compatible wastes consolidated for bulk transport to an offsite RCRA compliant facility for disposal/reuse. Contaminated soils from Areas C and D and the area around monitoring well 09B and solids from the drums would be stabilized onsite using a mobile stabilization unit. The stabilized matrix must pass TCLP and or other EPA approved leachate test and ASTM strength tests to meet performance specifications. Stabilized material will be returned to the Area C excavation pit and a slurry wall will be installed to the bedrock around the stabilized soils to provide additional containment and reduce the long term uncertainties. Groundwater encountered during the excavation will be removed and transported to an offsite RCRA compliant facility for treatment and disposal; mixed with the contaminated soils and stabilized onsite; or, treated in an onsite

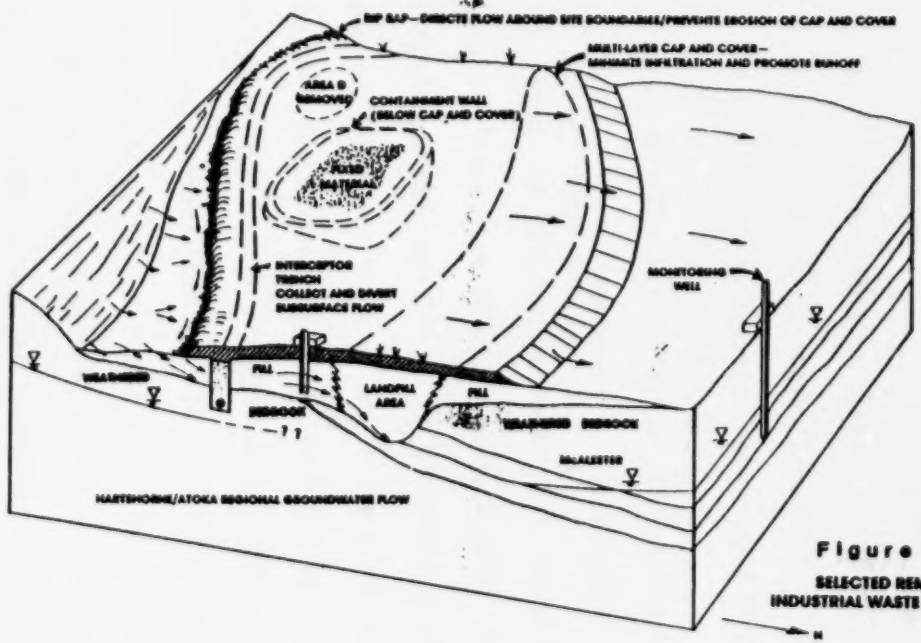

Figure 4

SELECTED REMEDY
INDUSTRIAL WASTE CONTROL

treatment facility. The treatment plant discharge location and efflument limitations would be established by EPA and the Arkansas Department of Pollution, Control and Ecology. Solid and liquid wastes resulting from the previous investigations at the site will be categorized during the Remedial Design with disposal consistent with disposition of Area C and D wastes. Then a multilayer RCRA cap will be constructed to cover the area bounded on the south, east, and west by the french drain system and on the north by the site boundary (the cap will cover approximately 7 acres). Site access will be controlled by installation of a security fence and land use restrictions to maintain the integrity of the containment system and prevent future development on site. Groundwater will be monitored and the site reviewed every five years to evaluate the effectiveness of the remedy and to take future corrective action, if necessary.

The selected remedy is protective of human health and the environment, cost-effective, and attains applicable or relevant and appropriate requirements. It utilizes permanent solutions and treatment technologies that reduce contaminant mobility, toxicity and volume to the maximum extent practicable.

Other alternatives were not selected for the following reasons:

No Action: This alternative does not protect public health and the environment. It does not meet the intent of SARA.

Alternative 2: This alternative was not selected because the constructability of the rigid barrier in mine void is questionable. Also, the cost of the barrier is too high in comparison to the benefits it would provide.

Alternative 4: This alternative was rejected because it provides about the same level of protection as the remedy selected but costs almost three times as much. The only significant difference between this remedy and the remedy selected is that in this alternative soils and solids from Areas C and D would be incinerated, instead of being stabilized.

Alternative 5: This alternative was not selected because this alternative would not provide much more protection than the selected remedy and costs about $5 million more. Also, the short term risks are higher because of extensive excavation in Area A and other areas of the site to create a RCRA vault.

Alternative 6: This alternative was rejected because of the higher short term risks associated with extensive excavation on site and large scale onsite incineration. Also, the cost is almost thirteen times that of the selected remedy and the incremental benefits do not justify the high cost.

APPENDIX A

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Substances
and Disease Registry

RECEIVED
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1986 JUL 28 AM 8 02
SUPERFUND BRANCH

Memorandum

Date JUL 22 1986

From Acting Director
Office of Health Assessment

Subject Review of Final Remedial Investigation Report, Industrial Waste Control Site, Fort Smith/Jenny Lind, Arkansas (SI-86-094B)

To Mr. Carl Hickam
Public Health Advisor
EPA Region VI

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA), Region V, submitted the Final Remedial Investigation Report to the Agency for Toxic Substances and Disease Registry (ATSDR) for review. Based upon the information provided, we find that remedial action measures may be necessary to prevent potential exposure from possible surface or subsurface releases of site contaminants. The current soil levels on-site and immediately off-site in an affected drainageway could pose a potential public health threat to children. Therefore, we recommend that public access to the contaminated areas be restricted. While groundwaters beneath the site are unacceptable for human consumption, no current opportunity for exposure exists. However, these groundwaters are hydraulically connected to groundwaters to the north where a few local residents still use private wells for various uses, including occasional consumptive uses. Therefore, we recommend long-term monitoring of the affected aquifers.

STATEMENT OF PROBLEM

EPA has requested ATSDR to review the Final Remedial Investigation Report (RI) for the Industrial Waste Control Site (IWC) and to assess the public health significance of the site.

SITE DESCRIPTION AND BACKGROUND

The IWC site, an abandoned coal strip mine, is a closed industrial waste landfill located about 8 miles from Fort Smith near Jenny Lind, Arkansas. While landfilling operations began in the late 1960's or early 1970's for municipal refuse and debris, an industrial landfill permit was granted by

the State in 1974. In 1977, impoundments on the site overflowed and contaminated a local pond and pastures; local farmers reported a fish kill in a pond and the death of several cattle. Consequently, the State closed the landfill in 1978. In addition to a variety of liquids, sludges, and solid wastes, the 8-acre site possibly contains about 9,000 buried drums.

Land use around the IWC site consists of pastureland, scattered residences, and a residential subdivision (Douglas Acres) to the northeast (about 1,400 feet). A residential well survey revealed that no residences within a one-half mile radius north of the site depend on private wells for drinking water. Most of the private residential wells identified in the RI are no longer used because of the existence of the South Sebastian County Rural Water Users Association and connection to the Fort Smith municipal water system. However, several local wells are still used for watering lawns, gardens, and livestock, a fish pond, and occasionally for domestic uses when the municipal supply is not functional.

Please refer to our January 8, 1986, report for our assessment of local residential well data. In this report, ATSDR recommended that residents should avoid drinking water from Well 28 because of elevated levels of benzo (A) pyrene (580 and 890 ppt). ATSDR could not find any other record of previous involvement on the site, or on the draft phases of the Remedial Investigation Report. We are concurrently reviewing the Final Draft Feasibility Study Report and the Endangerment Assessment Report; we will provide reports on them under separate cover.

LIST OF DOCUMENTS REVIEWED

1. Final Remedial Investigation Report, Industrial Waste Control Site, WA No. 69.6L37.0, Volume I and Volume II (Appendices), prepared for EPA by CH2M Hill, March 31, 1986.

CONTAMINANTS OF CONCERN

On-site monitoring wells reveal elevated levels of organic and inorganic

constituents including toluene (190 mg/L), methylene chloride (10 mg/L), arsenic (0.44 mg/L), lead (0.383 mg/L), chromium (0.300 mg/L), nickel (0.590 mg/L), manganese (44.4 mg/L), and barium (1.66 mg/L). Soil samples in the vicinity of the site revealed elevated levels of cadmium (56 mg/kg), beryllium (240 mg/kg), nickel (902 mg/kg), manganese (3,690 mg/kg), benzidine (13 mg/kg), and benzo (A) pyrene (37 mg/kg).

ENVIRONMENTAL AND EXPOSURE PATHWAYS

Ground Water

The RI provides little information on the possibility of future subsurface releases from buried drums. Of the environmental pathways present on the site, subsurface migration of contaminants from the site may pose the most potential public health threat. Liquid wastes and deteriorating drums containing liquid wastes are possible sources of contaminants.

According to the RI, up to four groundwater systems or aquifers exist in the vicinity of the IWC site: two separate artesian aquifers within the Lower Hartshorne Coal unit; a perched aquifer within the overburden, strip mine fill, and upper portions of the McAlester shale; and an unconfined aquifer within the Atoka Formation. With the exception of the perched aquifer beneath and immediately north of the site, all four aquifers have been or can be used as a water supply source. The perched aquifer that lies beneath the site has been contaminated from the site with both organic and inorganic constituents. Although off-site contamination exists in the perched aquifer north of the site, the concentrations are significantly lower except for manganese in one residential well. While the possibility exists that the perched aquifer is connected to the other three aquifers, no connection or contamination plume has been definitively demonstrated to date.

On-site well samples in the perched aquifer revealed elevated levels of toluene (190 mg/L), methylene chloride (10 mg/L), and acetone (45 mg/L).

Toluene and methylene chloride levels exceed both the draft health advisories[A] and the proposed Recommended Maximum Contaminant Levels (RMCL's)[B] for drinking water. On-site wells have been shown to be contaminated with arsenic (0.44 mg/L), chromium (0.300 mg/L), nickel (0.590 mg/L), lead (0.383 mg/L), barium (1.66 mg/L), selenium (0.049 mg/L), iron (515 mg/L), and manganese (44.4 mg/L) at levels which exceed one or more of the following: the current Maximum Contaminant Levels (MCL's)[C], Secondary MCL's [D], proposed RMCL's, and the draft health advisories for drinking water. Although arsenic was also detected in most of the artesian groundwater samples near the site, arsenic was not detected in the artesian groundwater samples taken farther from the site. Chromium and nickel were also detected in the near off-site perched and artesian groundwaters although no concentration plumes could be defined. While beryllium was detected in only on-site wells, vanadium was found both on-site and off-site in the perched aquifer. Although elevated levels of inorganics have been found in the unconfined aquifer south of the site, the RI indicates that this contamination is not related to the site. Elevated levels of iron and manganese have been found in nearly all of the groundwater samples. The iron and manganese levels in on-site wells are significantly higher than in upgradient samples. The iron and manganese levels in the near off-site wells (just to the north and downgradient) are less than the on-site levels. However, these near off-site levels are greater than the levels found upgradient of the site, or the levels found farther north of the site, except for possibly one residential well.

We believe the discussion of the presence and potential for off-site migration through subsurface pathways is confusing in the RI. EPA informed us on June 30, 1986, that while the potential exists for off-site migration, they do not believe any subsurface migration has occurred to offsite areas.[E] This opinion was based on the study of the site hydrogeology, particularly four shallow monitoring wells (04S, 39S, 23S, and 40S) which were installed just north of the site. EPA explained that

these wells demonstrated that little or no groundwater flowed from the site through the perched aquifer.[E]

Because local geology is complex, we understand that it has been difficult to define the possible extent of contamination in the perched aquifer for off-site areas. However, we are concerned that three (04S, 39S, and 23S) of the four shallow monitoring wells just to the north of the site could not be used to measure groundwater quality in the perched aquifer. These three wells have gone dry. Initially, they contained very small amounts of groundwater which was attributed to minor leakage or seepage from the perched aquifer. Even though drilling information (Table 5-7 and Appendix C) confirmed the presence of a perched aquifer and an "unsaturated zone" (between the perched aquifer and the artesian aquifer), the perched aquifer is limited in both thickness and water yield just north of the site (p. 5-58). While Well 04S was set below the perched aquifer (Figure 5-20), Well 39S was set above the static water level of the perched aquifer (Figure 5-20). These two monitoring wells are the only two monitoring wells installed between the site and the residential wells (which lie north and northeast) to measure shallow groundwater flow in the perched aquifer. The other two shallow monitoring wells (23S and 40S) lie outside the predominant groundwater flow direction from the site. The "Geohydrology Cross Section" (Figure 5-21) also shows Well 23S to be screened in the "unsaturated zone" between the perched aquifer and the artesian aquifer.

Nevertheless, the RI states that "the results of inorganic sampling indicate that on-site contaminants have been transported off-site into both the perched and artesian groundwater systems" (p. 5-68). The RI also states the "most important pathway ..." for shallow off-site migration "...is probably lateral movement of contaminated perched groundwater to off-site locations" (p. 5-93). Nevertheless, due to the limited off-site contaminant concentrations found, the RI concludes that "...contaminant

criteria do set levels which prevent contamination which will be injurious to human health or aquatic life as defined by EPA and the Arkansas Water and Air Pollution Control Act, they are considered relevant and appropriate.

4.2.1.3 Solid Waste Disposal Act. The hazardous substances at the IWC site contain waste for which land disposal restrictions have been promulgated (40 CFR 268). This section lists waste where land disposal is either prohibited or will be prohibited at a future date. Since EPA Hazardous Waste Nos. F001-F005 have been disposed onsite, requirements in 40 CFR 268.30 relating to land disposal of material generated during a CERCLA response action between November 8, 1986 and November 8, 1988 are considered applicable. After November 8, 1988, prohibition of land disposal of solvent waste generated as a result of a CERCLA response action, unless it meets the treatment standards expressed as concentration limits for specific contaminants, will be applicable.

4.2.1.4 State Water Standards. The Arkansas Regulation Establishing Water Quality Standards for Surface Waters provides that the concentrations of toxicants in the receiving waters, after mixing with water from a point or non-point source, shall not exceed 0.1 of the 96-hour LC50 for the most sensitive indigenous species. These requirements are considered applicable to surface discharges from the site such as treatment plant effluent and runoff.

4.2.2 Action-Specific ARARs

4.2.2.1 Solid Waste Disposal Act (SWDA). The Solid Waste Disposal Act was amended by the Resource Conservation and Recovery Act and subsequent amendments (e.g. Hazardous and Solid Waste Amendments of 1984) to control hazardous substances. The provisions of RCRA pertinent to the IWC site have been promulgated under 40 CFR Parts 257, 260, 261, 262, 263, 264, 268, and 280. EPA has determined that the above regulations are "applicable" to RCRA characterized or listed hazardous wastes (40 CFR Part 260) which either: (1) were disposed at a site after November 19, 1980; or (2) the

CERCLA remedial action consists of treatment, storage, or disposal as defined by RCRA (40 CFR Part 264). In addition, these regulations are "relevant and appropriate" to RCRA hazardous wastes disposed at a site prior to November 19, 1980.

The contaminants of concern at the IWC site include listed RCRA hazardous wastes (methylene chloride, trichloroethene, tetrachloroethene, bis(2-ethylhexyl)phthlate, and toluene), but landfill operations ceased in 1978. Therefore, the RCRA regulations are directly applicable for any remedial action involving treatment, storage, and disposal as defined by RCRA.

RCRA permits are not required for onsite remedial actions. Therefore, administrative RCRA requirements (i.e., reporting, record keeping, etc.) are not "applicable or relevant and appropriate" for onsite activities. However, all hazardous waste disposed offsite are required by CERCLA 121(d)(3) to be in compliance with all pertinent RCRA requirements.

- RCRA Storage Requirements - EPA defines storage under RCRA to be a RCRA hazardous waste which is held for a temporary period, at the end of which the hazardous waste is treated, disposed, or stored elsewhere (40 CFR 260.10). The RCRA requirements are "applicable" to activities of this type. In some cases, the hazardous waste may first become subject to regulation as a result of the action taken at the cleanup site. If the party or parties conducting the cleanup are considered the generators of the waste, 40 CFR 262.34 provides that, under certain conditions the waste may be stored for 90 days before the RCRA Part 264 requirements become "applicable".

  In the case of the IWC site, the RCRA requirements are applicable only to any waste collected during remedial activities which may be stored over 90 days. The requirements are relevant and appropriate for all other storage activities such as temporary storage of the buried drums because the actions governed by the requirement are sufficiently similar to those which may take place.

- RCRA Treatment Requirements - CERCLA 121 establishes a preference for remedial actions involving treatment that permanently and significantly reduces the volume, toxicity, or mobility of the hazardous substance, pollutants, and contaminants at the CERCLA site. The RCRA requirements are applicable at a site if (1) the waste is defined as hazardous, (2) the treatment complies with the RCRA definition contained in 40 CFR 260.10, and (3) the special jurisdictional prerequisites in the pertinent subpart for each category of treatment are satisfied. Otherwise, the RCRA requirements are "relevant and appropriate".

  The RCRA requirements are applicable for all treatment units at the IWC site such as incineration which are described by one of the RCRA regulations. The RCRA requirements are only "relevant and appropriate" for other treatment units such as tanks which might be used to treat a non-RCRA hazardous waste because they are well suited for the particular remedial actions being proposed.

- RCRA Disposal Requirements - EPA has defined disposal under RCRA to be the movement (grading, excavation, etc.) of a RCRA hazardous waste originally disposed before the 1980 effective date of RCRA from within a unit area of contamination and placed in another location outside the unit area of contamination. The RCRA requirements are "applicable" to activities of this type, and "relevant and appropriate" to similar activities.

  In the case of the IWC site, the landfill and the surface impoundments are considered to be "units", and therefore onsite and offsite disposal outside of the unit area of contamination would fall under these requirements and therefore be applicable. Using the disposal requirements in this manner requires that the RCRA design and operational requirements be met. These would include the design requirements for landfills (including waste piles during construction).

- Land Disposal Requirements - The disposal of RCRA hazardous waste during the course of remedial action may also be subject to the special restrictions on land disposal of hazardous waste established by the Hazardous and Solid Waste Amendments of 1984 (HSWA). According to HSWA, all RCRA hazardous waste are to be reviewed by EPA to determine if they should be banned from land disposal facilities. Banned waste cannot be placed in or on the land unless they have been first treated to levels achievable by best demonstrated available technology (BDAT) for each hazardous constituent in the waste. These conditions are applicable to the offsite disposal of the buried drums containing free liquid and will become applicable to onsite disposal or treatment of this waste after November 8, 1988.

4.2.2.2 NPDES. During remediation, CERCLA 121(d) requires that storm water discharges and remedial-activity generated discharges meet the pollutant limitation and performance standards included in the Clean Water Act. The wastewater treatment technology proposed in response alternatives for CERCLA sites are required to meet the equivalent of best conventional pollutant control technology (BCT) and best available technology economically achievable (BAT). EPA has promulgated the technology-based requirements through effluent limitation guidelines for specific categories of industries with on-going operations which are then transferred into specific discharge limits by NPDES permit writers. Where effluent guidelines for a specific industry or industrial category do not exist (e.g., Superfund sites), technology-based treatment requirements equivalent to BCT/BAT will be determined on a case-by-case basis using best professional judgment (BPJ) in accordance with CWA 402(a)(1)(B) and 40 CFR 125.3(c)(2). Such requirements would be applied to the scrubber effluent from an onsite incinerator as an example.

4.2.2.3 State Hazardous Waste Management Act. The Arkansas Hazardous Waste Management Code states siting criteria that are in addition to those contained in RCRA (40 CFR 264.18). Although permits are not required for onsite CERCLA activities, the substantive portions are considered applicable to onsite remedial actions. Specifically, these requirements include:

- the active portions of a hazardous waste management facility can not be located within 200 feet of a property line;
- the active portions of a hazardous waste management facility can not be located within 300 feet of a public road, a water or wastewaster line other than a service line to the facility, and power transmission lines other than service lines to the facility; and
- landfills or surface impoundments shall not be located where the bottom of the liner is less than 10 feet from the historically high water table.

All of the above requirements may be applicable to the IWC site.

4.2.2.4 Air Quality. The Clean Air Act was promulgated "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the production capacity of its population". Sections of the Clean Air Act establishing Standards of Performance for Incinerators (40 CFR 60.50-54) and the National Emission Standards for Hazardous Air Pollution (40 CFR 61) which set emission standards for incineration and the handling of volatile organic compounds (fugitive emissions) are considered applicable to some of the alternatives developed in this FS.

Regulations promulgated by the State of Arkansas Water and Air Pollution Control Act are also considered to be applicable or relevant and appropriate. The Arkansas Air Pollution Control Code sets standards for particulates that are applicable to any alternative utilizing onsite incineration. Regulations for the Control of Volatile Organic Compounds may be relevant and appropriate for the storage of volatile organics because of the hazardous nature of the materials found onsite even though the capacity limits for storage tanks will not be exceeded.

4.2.3 Location-Specific ARARs

No location specific ARARs were identified for the IWC site. The IWC site, is not located within a flood plain, wetlands, wilderness area, historic site, or other protective designations.

TABLE 4-1
POTENTIAL CONTAMINANT-SPECIFIC ARARs
IWC SITE

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Federal Contaminant-Specific ARARs				
Safe Drinking Water Act	40 U.S.C. Sect. 300			
National Primary Drinking Water Standards	40 C.F.R. Part 141	Establishes health-based standards for public water systems (maximum contaminant levels).	No/Yes	The MCLs for organic and inorganic contaminants are relevant and appropriate for the groundwater in the Artesian system in Mine No. 17.
National Secondary Drinking Water Standards	40 C.F.R. Part 143	Establishes welfare-based standards for public water systems (secondary maximum contaminant levels.)	No/Yes	Secondary MCLs for inorganic contaminants are relevant and appropriate for the groundwater in the Artesian system in Mine No. 17.
Maximum Contaminant Level Goals	Pub. L. No. 99-339, 100 Stat. 642 (1986)	Establishes drinking water quality goals set at levels of no known or anticipated adverse health effects, with an adequate margin of safety.	No/Yes	Proposed MCLGs for inorganic contaminants should be treated as "other criteria, advisories, and guidance."
Clean Water Act	33 U.S.C. Sect. 1251-1376			
Water Quality Criteria	40 C.F.R. Part 131 Quality Criteria for water, 1976, 1980, 1986	Sets criteria for water quality based on toxicity to aquatic organisms and human health.	No/Yes	AWQCs for PAHs, aromatics, and metals are relevant and appropriate.
Toxic Pollutant Effluent Standards	40 C.F.R. Part 129	Establishes effluent standards or prohibitions for certain toxic pollutants: aldrin/dieldrin, DDT, endrin, toxaphen, benzidine, PCBs.	No/No	These pollutants are not present on the site at levels above CLP detection limits.

TABLE 4-1 (Continued)
POTENTIAL CONTAMINANT-SPECIFIC ARARs
IWC SITE

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Solid Waste Disposal Act ("SWDA")	40 U.S.C. Sect. 6901-6987			
Identification and Listing of Hazardous Waste	40 C.F.R. Part 261	Defines those solid wastes which are subject to regulation as hazardous wastes under 40 C.F.R. Parts 262-265 and Parts 124, 270, and 271.	No/No	Creates no substantive clean-up requirements. Under CERCLA, SWDA requirements may be relevant and appropriate under the circumstances of the release at the site. In this chart, any solid wastes which pose a threat to public health or welfare or the environment are termed "hazardous materials."
Land Disposal	40 C.F.R. Part 268	Established a timetable for restriction of burial of wastes and other hazardous materials.	Yes/No	The treatment standards expressed as concentration limits for specific contaminants in leachate are applicable to organics present at the IWC site.
Clean Air Act	42 U.S.C. Sect. 7401-7642			
National Primary and Secondary Ambient Air Quality Standards	40 C.F.R. Part 50	Established standards for ambient air quality to protect public health and welfare (including standards for particulate matter and lead).	No/No	The IWC site is not considered to be a source of air pollution.

APPENDIX D

Industrial Waste Control
Community Relations Responsiveness Summary

This Community Relations Responsiveness Summary has been prepared to provide written responses to comments submitted regarding the proposed plan of action at the Industrial Waste Control (IWC) hazardous waste site. The summary is divided into two sections:

Section I: Background of Community Involvement and Concerns. This section provides a brief history of community interest and concerns raised during the remedial planning activities at the Industrial Waste Control site.

Section II: Summary of Major Comments Received. The comments (both oral and written) are summarized and EPA's responses are provided.

I. Background of Community Involvement

Adjacent property owners have been aware of the site since the early 1970s. As a result of the heavy rains in 1977, a resident whose property is directly north (downgradient) of the IWC property filed suit in 1978 against IWC for loss of cattle, forage, and fish. Since that time adjacent property owners have had contact with the state during well testing trips and other site investigation activities.

Local officials and residents of Greenwood and Fort Smith were generally not aware of the Superfund site until the National Priorities List (NPL) was published in December 1982. The Southwest Times Record and KFSM-TV of Fort Smith ran stories about the site at that time. The Greenwood Democrat also ran an article on the site in December 1983. The media coverage did not appear to generate a great deal of local interest. Area residents expressed a general concern regarding possible well contamination.

In the summer of 1986, EPA distributed a fact sheet regarding the results of the remedial investigation and the feasible alternatives for clean-up. Thirty-seven citizens attended a public meeting on July 1, 1986. In March and December of 1987, EPA issued updates advising the citizens of the Steering Committee's supplemental study. No additional concern/questions or comments were generated as a result of these two updates.

II. Summary of Major Comments Received

The press release and Proposed Plan fact sheet announcing the public comment period and public meeting were distributed on April 19, 1988. The comment period began on May 2 and ended June 2, 1988. A public meeting was held with area residents and local officials on May 9 at the South Sebastian County Courthouse. The purpose of this meeting was to explain the results of the remedial investigation and to outline the various alternatives presented in the feasibility study. Thirty-five people from the area attended the meeting, and 5 residents made oral statements or asked questions. Written comments or questions were received from one additional citizen and the IWC Steering Committee.

Overall, the residents and local officials do not oppose the proposed plan. During the public comment period, there were comments/questions regarding the following:

Comment #1: If the proposed remedy is implemented, what restrictions will be placed on land use?

EPA Response: Because this remedy leaves some contamination on the site covered by a cap, it is not appropriate for either residential or commercial use after the remedy is completed. The site will be fenced to restrict access.

Comment #2: For the neighbors near the site, what hazards or risks are associated with the actual construction?

EPA Response: At this time, we cannot say specifically the amount of air emissions that might be released during the construction. As we are designing the remedy, we will include various measures to ensure the safety of the neighbors. During excavation, air monitors will be used continuously to measure the situation and storm water runoff control will be required.

Comment #3: What information do you have about contamination in the strip mine near the east end?

EPA Response: Samples taken from the trenches in the strip mine area indicate that the contamination is located on the west end of the strip mine. The east side of the mine was used for disposal of construction debris and similar materials that are not toxic.

Comment #4: What will the sequence of construction be; i.e., will stabilization and drum removal be happening at the same time?

EPA Response: The construction sequence will be determined during the design phase. However, the liquid-filled drums will probably be removed before work begins on the stabilization portion.

Comment #5: A clay cap will meet the remedial objectives, so a multilayer cap is not necessary.

EPA Response: During the technology screening phase of the Feasibility Study, several types of caps were considered and assessed with respect to meeting the remedial action objectives. Native soil, clay, sprayed asphalt, multilayer, and other cap types were considered. Clay cap and multilayer cap were compared in detail. The multilayer cap was considered most appropriate for this site because:

a) There are considerable quantities of biodegradable material in some portions of the site, such as wood, that will decompose with time and cause some subsidence. The multilayer cap should not fail under moderate subsidence areas, while a clay cap probably would.

b) If groundwater monitoring north (downgradient) of the site detects offsite migration of contaminants, it is an indication that the remedy has failed. Because reaction time is extremely limited, the design should be conservative on the protective side.

c) There is no bottom barrier, other than natural rocks and strata, incorporated into the design of the partial containment structure at the site. Therefore, the elements of the remedial alternative that prevent water entry into the site should be the most protective ones available.

Comment #6: The site-side barrier associated with the french drain could be either a synthetic membrane or a slurry wall. The design phase of the project should determine which is more appropriate.

EPA Response: EPA agrees. The design intent for this barrier is to prevent onsite groundwater, which may be contaminated, from entering the french drain system. The barrier also provides an additional means of assuring that upgradient groundwater does not flow past the french drain. Designs which meet the intent will be acceptable.

Comment #7: The slurry wall around the stabilized waste is overprotective because the area is already protected by a french drain and cap.

EPA Response: Bench scale studies performed during the Remedial Investigation/Feasibility Study process indicated that the organic wastes at the site could be stabilized. The stabilization process would produce a mixture that when subjected to leaching tests would not release organic constituents at levels which exceeded those established by EPA. However, the long-term dependability of the stabilization of organic waste has not been demonstrated.

EPA has accepted stabilization of organic wastes at other sites as part of a final remedy. In almost every case, the stabilization mixture has been placed in a secondary containment structure such as a landfill vault. EPA believes that the slurry wall proposed for this site provides secondary containment consistent with the unproven long-term performance of stabilized organic wastes.

The primary purpose of the french drain and cap is to minimize water entering the site. These actions do not provide secondary containment of the stabilized organic wastes.

Comment #8: The selected alternative is too restrictive with respect to offsite disposal of liquid wastes. It should allow fuel blending in addition to, or in place of, incineration.

EPA Response: EPA agrees with this comment. Current federal and state regulations are very restrictive concerning techniques for disposal of liquid hazardous wastes. Incineration has been a standard, almost universal, technology for liquid wastes because they can no longer be landfilled. However, if there are reuse-type technologies or other disposal technologies that meet current or anticipated (near-term) federal and state regulations, EPA would consider these as acceptable.

Comment #9: The surface water diversion element in the selected remedy is appropriate and properly designed.

EPA response: EPA agrees that the surface water diversion structure is a logical design feature that ties the cap into the natural contours adjacent to the site. The surface water diversion structure should adequately divert surface water flowing towards the site from the south around the east and west ends of the site so surface water then continues into natural drainage north of the site.

Comment #10: Site access must be controlled to prevent possible destruction or damage to remedial elements such as the cap. A new permanent fence around the entire site would provide adequate protection.

EPA Response: EPA agrees. Fencing will be required as part of the final action.

Comment #11: There are several design-related issues that EPA plans to incorporate into the decision document that would be premature. These should be determined during the remedial design.

EPA Response: Presentation of design details in the Feasibility Study should not be construed to establish specific requirements for the final design. Rather, the level of detail presented in the Feasibility Study should be used to establish the design intent or minimum level of performance. Design details have been presented to demonstrate that a design concept can in fact be constructed and to provide a basis for estimating cost. EPA has attempted to establish minimum levels of performance and will review design details as they are developed.

Comment #12: Soils containing less that 1,000 parts per million total volatile organics or total base/neutral organics should be left on site, unstabilized.

EPA Response: The extent of clean up at a hazardous waste site should not be based just on the total concentration of a chemical group. The chemicals within that group will vary, probably considerably, with respect to toxicity. For example, 1,000 ppm of volatile organics that are mostly trichloroethene would be much more toxic than 1,000 ppm of volatile organics that are mostly acetone. Clean-up criteria should be based on specific chemicals. Furthermore, this proposed concentration of 1,000 ppm has no basis. It is not related to a health risk, background level, or other appropriate criteria.

Clean-up levels should be based on chemicals and metals that were disposed at this site that are toxic or hazardous. These might include volatile organics such as toluene, trichloroethene, and methylene chloride and metals such as lead, nickel, and chromium. The clean-up levels (concentrations) should be established considering each chemical's toxicity, background levels, potential leachability, mobility, and onsite concentrations.

Comment #13: Could the site be used for a house or garden after the remedial action is complete?

EPA Response: The selected action is not a clean closure; that is, there will be wastes left in some parts of the site. Also, structures such as a multi-layer cap and a french drain (for groundwater control) will be built on the site to contain the wastes that are left. Therefore, the site cannot be used after the remedial action is in place. A fence will be constructed around the site to prevent access and the site will not be usable as long as the wastes remain. This will be much longer than 30 years. The groundwater would be monitored frequently throughout the first 30 years at a minimum.

Comment #14: When material is excavated to be stabilized, will it all be dug up at one time?

EPA Response: Only wastes within areas C and D will be excavated for stabilization. These two areas are on the southcentral and southwest portions of the site, and represent less than ten percent of the area of the 8-acre site. The excavation will be planned so that only one specific area will be opened at a time. The excavation process will also be planned to protect the landowners adjacent to the site from dust or odors as much as possible. Areas C and D do not include the former coal strip mine, so the old strip pit will not be dug up.

APPENDIX E

ADMINISTRATIVE RECORD INDEX

FINAL

SITE NAME: Industrial Waste Control

SITE NUMBER: ARD 980496368

INDEX DATE: 4/26/88

TABLE 4-1 (Continued)
POTENTIAL CONTAMINANT-SPECIFIC ARARs
IWC SITE

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
State Contaminant-Specific ARARs				
Arkansas Water and Air Pollution Control Act	Act 472 of 1949 as amended 82 Ark. Stat. 1901 et. seq.			
Arkansas Regulation Establishing Water Quality Standards for Surface Waters	Regulation No. 2, as Amended	Regulation establishing water quality standards for surface waters of the state of Arkansas. Sets concentration limits for toxicants from point and non-point sources discharging into Prairie Creek.	Yes/Yes	This regulation is applicable to point and non-point sources that would result from remedial actions. It is relevant and appropriate for non-point sources that are the result of present conditions at the site.
		Requires test to be performed in accordance with Toxic Charecteristics Leaching Procedure to determine treatment effectiveness.	No/Yes	Defines allowable concentration in leachate of any site contaminant in treated waste prior to disposal. The 0.1 concentration of the EPA freshwater acute criteria limit is more restrictive for inorganics than those contained in 40 C.F.R. 268. This requirement although not based on a promulgated requirement is considered applicable due to uniform enforcement at other sites in the state.

TABLE 4-2
POTENTIAL ACTION-SPECIFIC ARARs
IWC SITE

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Federal Action-Specific ARARs				
Solid Waste Disposal Act ("SWDA")	42 U.S.C. Sect. 6901-6987			
Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 C.F.R. Part 257	Establishes criteria for use in determining which solid wastes disposal facilities and practices pose a reasonable probability of adverse effects on health and thereby constitute prohibited open dumps.	Yes/Yes	If an alternative developed would involve the disposal of waste as defined under Subtitle D, this part is applicable. This part is relevant and appropriate for existing conditions at the IWC site involving the disposal of wastewater treatment sludges and other industrial waste which may pose a threat to human health or the environment.
Hazardous Waste Management System: General	40 C.F.R. Part 260	Establishes procedure and criteria for modification or revocation of any provision in 40 C.F.R. Part 260-265.	No/No	Creates no substantive cleanup requirements.
Identification and Listing of Hazardous Wastes	40 C.F.R. Part 261	Defines those solid wastes which are subject to regulation as hazardous wastes under 40 C.F.R. Parts 262-265 and Parts 124, 270, and 271.	No/No	Creates no substantive cleanup requirements.
Standards Applicable to Generators of Hazardous Waste	40 C.F.R. Part 262	Establishes standards for generators of hazardous waste.	Yes/No	If an alternative developed would involve offsite transportation of hazardous materials, these standards are applicable.
Standards Applicable to Transporters of Hazardous Waste	40 C.F.R. Part 263	Establishes standards which apply to persons transporting hazardous waste within the U.S. if the transportation requires a manifest under 40 C.F.R. Part 262.	Yes/No	If an alternative developed would involve offsite transportation of hazardous materials, these standards are applicable.
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 C.F.R. Part 264	Establishes minimum national standards which define the acceptable management of hazardous waste for owners and operators of facilities which treat, store, or dispose of hazardous waste.		

TABLE 4-2 (Continued)
POTENTIAL ACTION-SPECIFIC ARARs
IWC SITE

Standard, Requirements, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (Continued)	40 C.F.R. Part 264			
	Subpart B	General Facility Standards	Yes/No	General facility standards such as waste analysis, security, and personnel training are applicable to onsite and offsite remedial actions.
	Subpart C	Preparedness and Prevention	Yes/No	Preparedness and Prevention regulations pertaining to design, equipment, and communication standards are applicable to onsite and offsite remedial actions.
	Subpart D	Contingency Plan and Emergency Procedures	Yes/No	Regulations requiring the development of a contingency plan and emergency procedures are applicable to onsite and offsite remedial actions.
	Subpart E	Manifest System, Recordkeeping, and Reporting	Yes/No	Regulations requiring recordkeeping and reporting are applicable to facilities receiving waste from the IWC site.
	Subpart F	Releases from Solid Waste Management Units	No/Yes	Groundwater protection requirements involving monitoring and compliance are considered relevant and appropriate for the existing surface impoundments and landfill at the IWC site if complete remediation is not performed.
	Subpart G	Closure and Post-Closure	Yes/Yes	Substantive portions of this subpart establishing closure and post-closure requirements to prevent threats to human health and the environment are applicable for onsite remedial actions such as landfills. Requirements of this subpart are relevant and appropriate for the existing surface impoundments and landfill if complete remediation is not performed.
	Subpart H	Financial Requirements	No/No	Financial requirements for closure and post-closure activities are not applicable or relevant.

TABLE 4-2 (Continued)
POTENTIAL ACTION-SPECIFIC ARARs
IWC SITE

Standard, Requirements, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (Continued)	40 C.F.R. Part 264			
	Subpart I	Use and Management of Containers	Yes/No	Requirements for storage of containers of hazardous waste are applicable to Remedial Actions at the IWC site.
	Subpart J	Tanks	Yes/No	If an alternative would use tanks for the treatment or storage of hazardous material, the requirements for design, operation, inspection and closure are considered applicable.
	Subpart K	Surface Impoundments	No/Yes	Closure and post-closure requirements are relevant and appropriate for the existing surface impoundments at the IWC site.
	Subpart L	Waste Piles	Yes/No	If an alternative developed would involve treatment or storage of hazardous materials in piles, requirements for design, operation, closure, and post-closure are applicable.
	Subpart M	Land Treatment	No/No	No alternative developed would involve land treatment.
	Subpart N	Landfills	Yes/Yes	If an alternative developed would involve disposal of hazardous materials in a landfill, requirements for design, operation, closure and post-closure are applicable. Closure and post-closure requirements are relevant and appropriate for the landfill formerly operated at the IWC site.
	Subpart O	Incinerators	Yes/No	If an alternative developed would involve incineration, requirements in this part are applicable.

TABLE 4-2 (Continued)
POTENTIAL ACTION-SPECIFIC ARARs
IWC SITE

Standard, Requirements, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Interim Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 C.F.R. Part 265	Establishes minimum national standards that define the acceptable management of hazardous waste during the period of interim status and until certification of final closure, or if the facility is subject to post-closure requirements, until post-closure responsibilities are fulfilled.	No/No	Remedies should be consistent with the more stringent Part 264 standards as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of public health and welfare and the environment.
Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities	40 C.F.R. Part 266	Establishes requirements which apply to recyclable materials that are reclaimed to recover economically significant amounts of precious metals, including gold and silver.	No/No	Does not establish additional cleanup requirements.
Interim Standards for Owners and Operators of New Hazardous Waste Land Disposal Facilities	40 C.F.R. Part 267	Establishes minimum national standards that define acceptable management of hazardous waste for new land disposal facilities.	No/No	Remedies should be consistent with the more stringent Part 264 standards as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of public health and welfare and the environment.
Land Disposal	40 C.F.R. Part 268	Established a timetable for restriction of burial of wastes and other hazardous materials.	Yes/No	If an alternative developed would involve burial of prohibited material, this part is applicable.
Hazardous Waste Permit Program	40 C.F.R. Part 270	Establishes provisions covering basic EPA permitting requirements.	No/No	A permit is not required for onsite CERCLA response actions. Substantive requirements are addressed in 40 C.F.R. Part 264.
Underground Storage Tanks	40 C.F.R. Part 280	Establishes regulations related to underground storage tanks.	No/No	No alternative developed would involve use of underground storage tanks.

TABLE 4-2 (Continued)
POTENTIAL ACTION-SPECIFIC ARARs
IWC SITE

Standard, Requirements, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Occupational Safety and Health Act	29 U.S.C. Sect. 651-678	Regulates worker health and safety.	Yes/Yes	Under 40 C.F.R. Sect. 300.38, requirements of the Act apply to all response activities under the NCP.
Safe Drinking Water Act	42 U.S.C. Sect. 300g			
Standards for Owners and Operators of Public Water Supply Systems	40 C.F.R. 141	Defines treatment (water quality) requirements for public water supply systems.	No/No	No alternative considered involves a public water supply system.
Underground Injection Control Regulations	40 C.F.R. Parts 144-147	Provides for protection of underground sources of drinking water.	Yes/No	If an alternative developed would involve underground injection, this part is applicable.
Clean Water Act	33 U.S.C. Sect. 1251-1376			
National Pollutant Discharge Elimination System	40 C.F.R. Parts 122, 125	Requires permits for the discharge of pollutants from any point source into waters of the United States.	Yes/No	A permit is not required for onsite CERCLA response actions, but the substantive requirements would apply if an alternative developed would discharge into the watershed of Prairie Creek.
National Pretreatment Standards	40 C.F.R. Part 403	Sets standards to control pollutants which pass through or interfere with treatment processes in publicly owned treatment works or which may contaminate sewage sludge.	No/No	No alternative will be developed which would involve discharge to publicly owned treatment works.
Toxic Pollutant Effluent Standards	40 C.F.R. Part 129	Establishes effluent standards or prohibitions for certain toxic pollutants: aldrin/dieldrin, DDT, endrin, toxaphene, benzidine, PCBs.	No/No	These contaminants were not found at the IWC site.
Marine Protection, Research, and Sanctuaries Act	13 U.S.C. Sect. 1401-1445	Regulates ocean dumping.	No/No	No ocean dumping will occur.

TABLE 4-2 (Continued)
POTENTIAL ACTION-SPECIFIC ARARs
IWC SITE

Standard, Requirements, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Toxic Substances Control Act PCB Requirements	13 U.S.C. Sect. 2601-2629 40 C.F.R.	Establishes storage and disposal requirements for PCBs.	No/No	PCBs were not found at the IWC site.
Clean Air Act	42 U.S.C. Sect. 7401-7642			
National Ambient Air Quality Standards/ NESHAPSINSPS/BACT/ PSD/LAER	40 C.F.R. 60.1-.17, .50-.54, .150-.154, .480-.489, 40 C.F.R. 53.1-.33 40 C.F.R. 61.01-.18, .50-.112, .240-.247	Treatment technology standard for emissions to air o incinerators o surface impoundments o waste piles o landfills o fugitive emissions	Yes/No	If an alternative developed would involve emissions governed by these standards, then the requirements are applicable.
Hazardous Materials Transportation Act	49 U.S.C. Sect. 1801-1813			
Hazardous Materials Transportation Regulations	49 C.F.R. Parts 107, 171-177	Regulates transportation of hazardous materials.	Yes/No	If an alternative developed would involve transportation of hazardous materials, these requirements are applicable.
State Action-Specific ARARs				
Arkansas Water and Air Pollution Control Act	Act 472 of 1949 as amended; 82 Ark. Stat. 1901, et. seq.			
Actions Declared Unlawful	82-1908	Requires that no industrial waste be placed where it can cause pollution of the waters of the state.	Yes/Yes	This section is applicable if any alternative developed would involve landfilling or above ground waste storage. This section is relevant and appropriate to prior disposal practices at the site.
Arkansas Underground Injection Control Code		Provides for protection of underground sources of drinking water.	Yes/No	If an alternative developed would involve underground injection in the state, these requirements would be applicable.

TABLE 4-2 (Continued)
POTENTIAL ACTION-SPECIFIC ARARs
IWC SITE

Standard, Requirements, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Arkansas NPDES Regulations	Regulation No. 6	Requires permits for the discharge of pollutants from any point source into the waters of the State of Arkansas.	Yes/No	A permit is not required for onsite CERCLA response actions, but the substantive requirements would apply.
Regulations for the Control of Volatile Organic Compounds		Requires permits for the storage of volatile organic compounds.	No/Yes	A permit is not required for onsite CERCLA response actions, but this regulation may be relevant if an alternative developed would store Toxic VOC.
Arkansas Air Pollution Control Code		Sets standards for particulate emissions.	Yes/No	A permit is not required for onsite CERCLA response action, but substantive portions of this act would be applicable if an alternative utilizes incineration.
Arkansas Hazardous Waste Management Act	Act 406 of 1979 Ark. Stat. 82-4			
Arkansas Hazardous Waste Management Code		Sets siting criteria standards in addition to those contained in 40 C.F.R. 264.18.	Yes/Yes	Substantive requirements of this code are applicable to the IWC Site. However, siting requirements that are in addition to 40 C.F.R. 264.18 and are applicable to the IWC Site may be waived due the fact that not adhering to these requirements will not pose an unacceptable risk to human health or safety.

TABLE 4-3
POTENTIAL LOCATION-SPECIFIC ARARs
IWC SITE

Standard, Requirements, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Federal Location-Specific ARARs				
National Historic Preservation Act	16 U.S.C. Sect. 470 40 C.F.R. Sect. 6301(b) 36 C.F.R. Part 800	Requires Federal agencies to take into account the effect of any Federally-assisted undertaking or licensing on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places.	No/No	The remedies will not affect any current district site, building, structure, or object listed on or eligible for the National Register.
Archeological and Historic Preservation	16 U.S.C. Sect. 469 40 C.F.R. Sect. 6.301(c)	Establishes procedures to provide for preservation of historical and archeological data which might be destroyed through alteration of terrain as a result of a Federal construction project or a Federally licensed activity or program.	No/No	The remedies will not affect current historical or archeological data.
Historic Sites, Buildings, and Antiquities Act	16 U.S.C. Sect. 461-467 40 C.F.R. Sect. 6.301(a)	Requires Federal agencies to consider the existence and location of landmarks on the National Registry of Natural Landmarks to avoid undesirable impacts on such landmarks.	No/No	The remedies will not affect any current Natural Landmark.
Fish and Wildlife Coordination Act	16 U.S.C. Sect. 661-666	Requires consultation when Federal department or agency proposes or authorizes any modification of any stream or other water body and adequate provision for protection of fish and wildlife resources.	No/No	No alternative developed will modify a stream or water body under provisions of this act.
Endangered Species Act	16 U.S.C. 1531 50 C.F.R. Part 200 50 C.F.R. Part 402	Requires action to conserve endangered species within critical habits upon which endangered species depend, includes consultation with Department of [illegible]rior.	No/No	No threatened or endangered species or critical habitats were identified in or near the site.

TA. 4-3 (Continued)
POTENTIAL LOCATION-SPECIFIC ARARs
IWC SITE

Standard, Requirements, Criteria, or Limitations	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Clean Water Act	33 U.S.C. Sect. 1251 et. seq.			
Dredge or Fill Requirements (Section 404)	40 C.F.R. Parts 230, 231	Requires permits for discharge of dredged or fill material into navigable waters.	No/No	No alternative will be developed which will discharge dredge or fill material into navigable waters.
Rivers and Harbors Act of 1899	33 U.S.C. Sect. 403			
Section 10 Permit	33 C.F.R. Parts 320-330	Requires permit for structures or work in or affecting navigable waters.	No/No	No alternative involves work that would affect a navigable waterway.
Executive Order on Protection of Wetlands	Executive Order No. 11,990 40 C.F.R. 6.302(a) and Appendix A	Requires Federal agencies to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practicable alternative exists.	No/No	No alternative developed will affect a current wetland.
Executive Order on Flood Plain Management	Executive Order No. 11,988	Requires Federal agencies to evaluate the potential effects of actions they may take in a flood plain to avoid, to the extent possible, the adverse impacts associated with direct and indirect development of a flood plain.	No/No	No alternative developed will affect a flood plain.
Wilderness Act	16 U.S.C. 1311 50 C.F.R. 35.1	Administer federally owned wilderness area to leave it unimpacted.	No/No	No wilderness area onsite or adjacent to site.
National Wildlife Refuge System	16 U.S.C. 668 50 C.F.R. 27	Restricts activities within a National Wildlife Refuge.	No/No	No wilderness area onsite or adjacent to site.
Scenic River Act	16 U.S.C. 1271 40 C.F.R. 6.302(e)	Prohibits adverse effects on scenic river.	No/No	No scenic river in area.
Coastal Zone Management Act	16 U.S.C. 1451	Conduct activities in accordance with State approved management program.	No/No	Area is not in the coastal zone.